December 1961
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AMERICAN

Journal of Public Health

AND THE
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AMERICAN
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1. Mathieu, P. L., Jr., et al.: Rhode Island M.J. 42:172, 1959.

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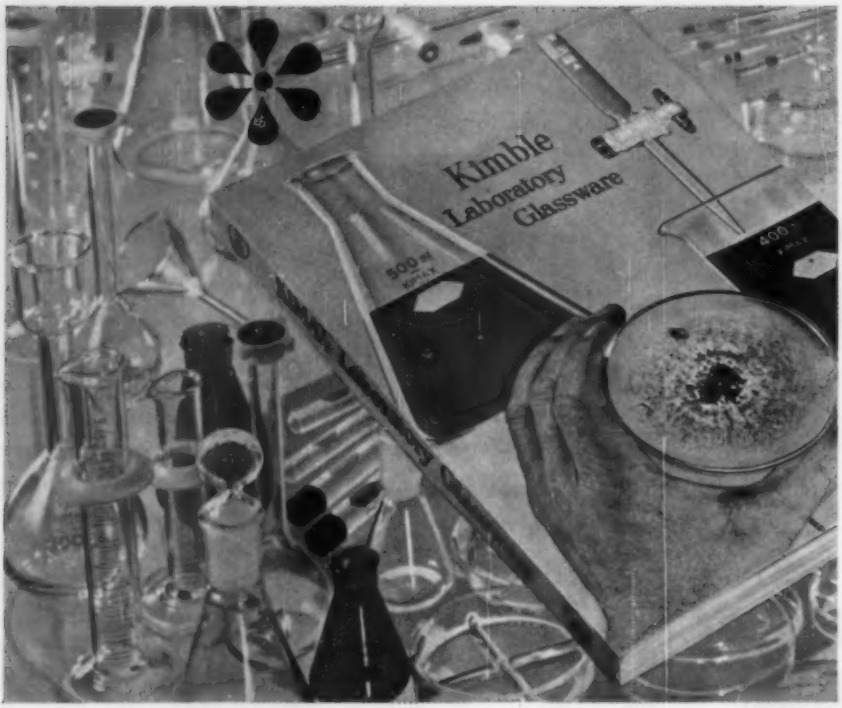

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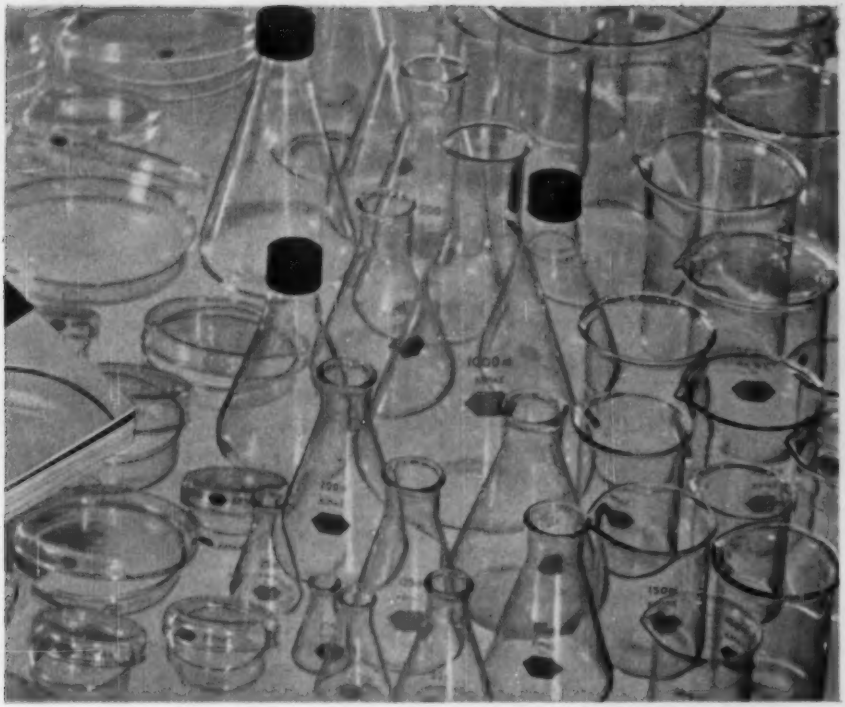

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*Russell, W. F., Jr.; Lynch, H. J.; Doto, I., and Furcolow, M. L.; Comparison of Tuberculin Skin Reactions: Tine Test vs. Intracutaneous, Scientific Exhibit, 110th Annual Meeting, A.M.A., New York, June 26-30, 1961.

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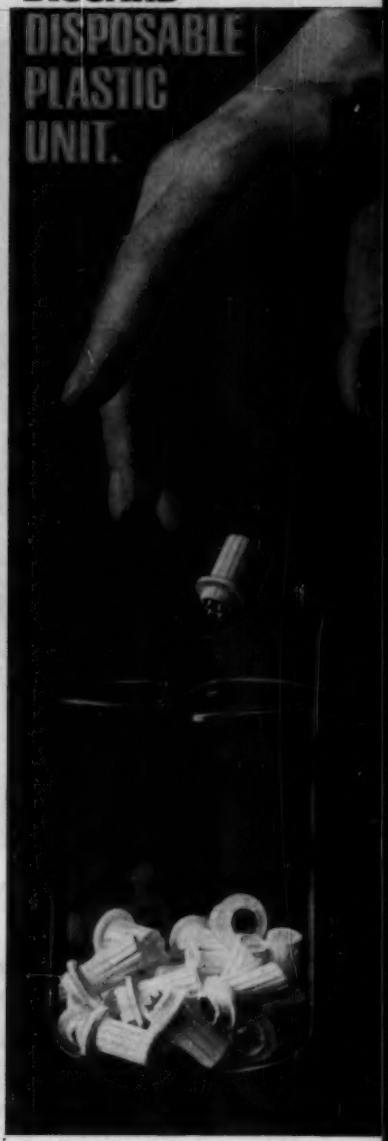

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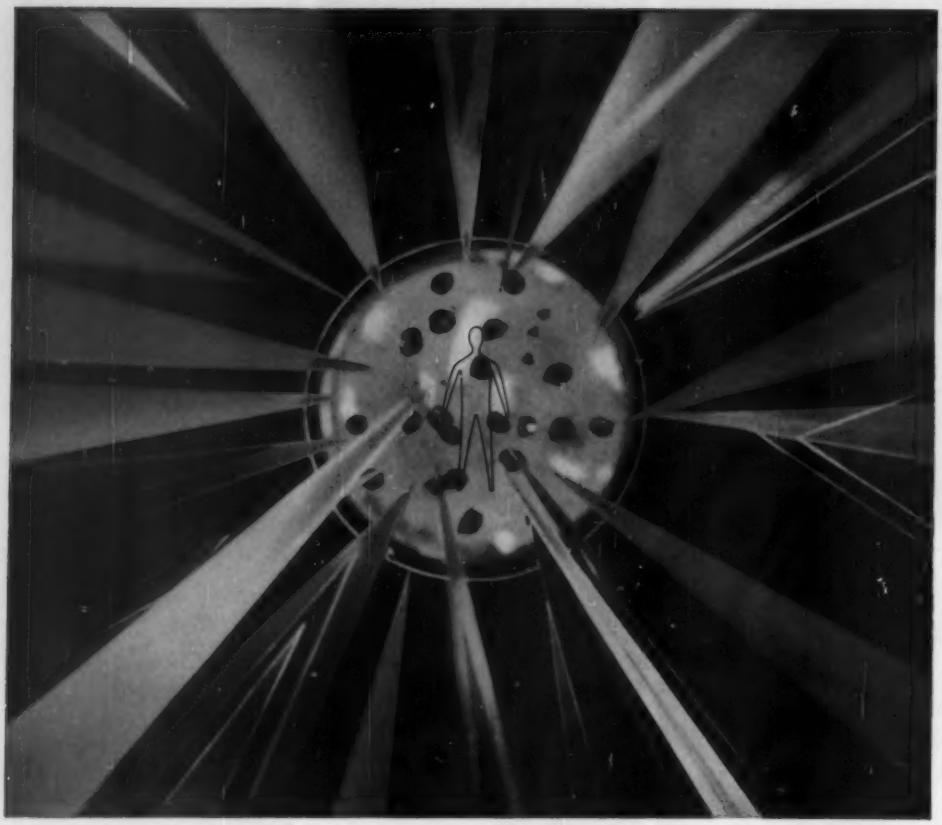

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for prompt, dependable broad spectrum antibacterial action.

because... it contains Fungizone, the antifungal antibiotic,
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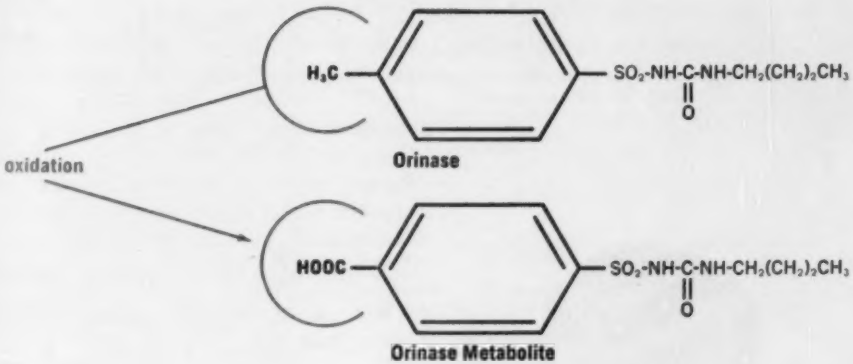
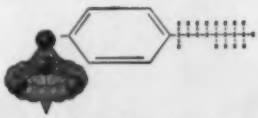


Orinase*



An exclusive methyl "governor" minimizes hypoglycemia

Indications and effects: The clinical indication for Orinase is stable diabetes mellitus. Its use brings about the lowering of blood sugar; glycosuria diminishes, and such symptoms as pruritus, polyuria, and polyphagia disappear.

Dosage: There is no fixed regimen for initiating Orinase therapy. A simple and effective method is as follows: *First day*—0 tablets; *second day*—4 tablets; *third day*—2 tablets. The daily dose is then adjusted—raised, lowered or maintained at the two-tablet level, whichever is necessary to maintain optimum control.

Patients receiving insulin (less than 20 units)—discontinue insulin and institute Orinase; (20 to 40 units)—initiate Orinase with a concurrent 30 to 50% reduction in insulin dose with a further careful reduction as response to Orinase is observed; (more than 40 units)—reduce insulin by 30%, and initiate Orinase with a further careful reduction in insulin dosage as response to Orinase is observed. In candidates for combined Orinase-insulin therapy, an individualized schedule is usually obtainable during a trial course of two or more weeks.

Contraindications and side effects: Orinase is contraindicated in patients having juvenile or growth-onset, unstable or brittle types of diabetes mellitus; history of diabetic coma, fever, severe trauma or gangrene.

Side effects are mild, transient and limited to approximately 3% of patients. Hypoglycemia and toxic reactions are extremely rare. Hypoglycemia is most likely to occur during the period of transition from insulin to Orinase. Other untoward reactions to Orinase are usually not of a serious nature and consist principally of gastrointestinal disturbances, headache, and variable allergic skin manifestations. The gastrointestinal disturbances (nausea, epigastric fullness, heartburn) and headache appear to be related to the size of the dose, and they frequently disappear when dosage is reduced to maintenance levels or the total daily dose is administered in divided portions after meals. The allergic skin manifestations (pruritus, erythema, and urticarial, morbilliform, or maculopapular eruptions) are transient reactions, which frequently disappear with continued drug administration. However, if the skin reactions persist, Orinase should be discontinued.

Clinical toxicity: Orinase appears to be remarkably free from gross clinical toxicity on the basis of experience accumulated during more than four years of clinical use. Crystalluria or other untoward effects on renal function have not been observed. Long-term studies of hepatic function in humans and experience in over 650,000 diabetics have shown Orinase to be remarkably free of hepatic toxicity. There has been reported only one case of cholestatic jaundice related to Orinase administration, which occurred in a patient with pre-existing liver disease and which rapidly reversed upon discontinuance of the drug.

Each tablet contains:
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Offers these advantages

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- ... may abort early syphilis in mixed infections
- ... is especially useful in community control of acute gonorrhea

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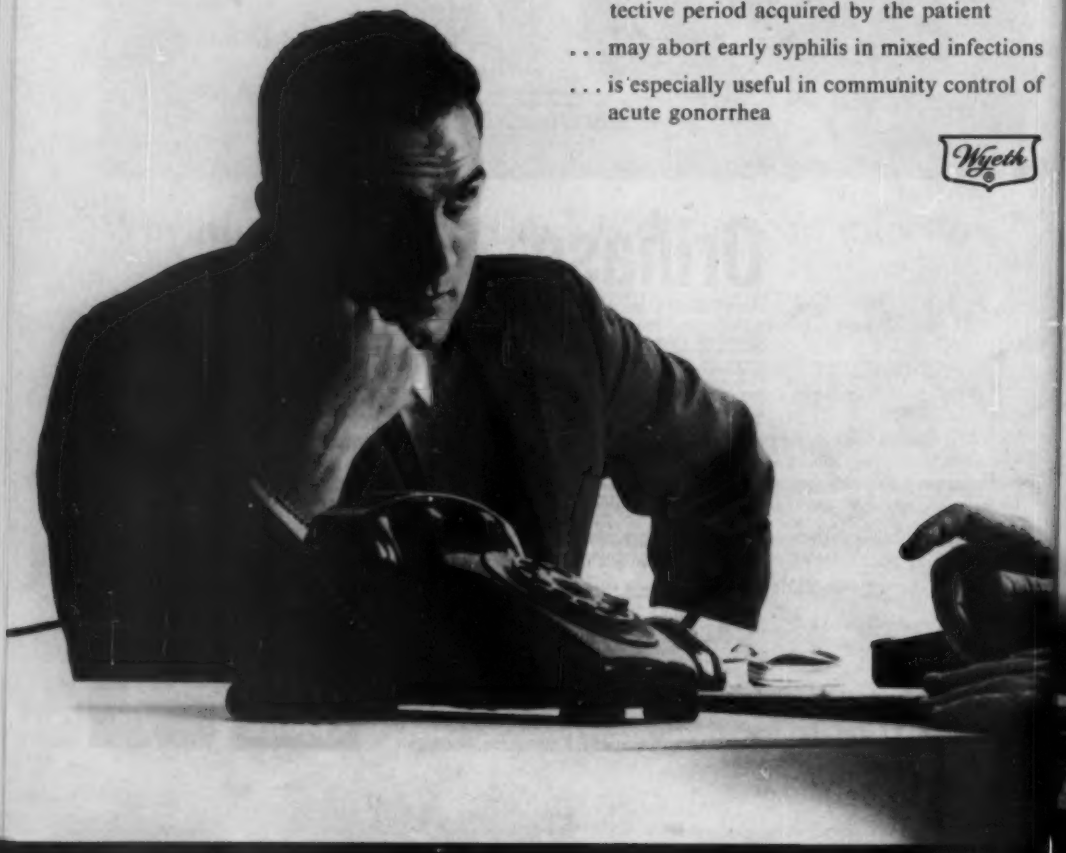

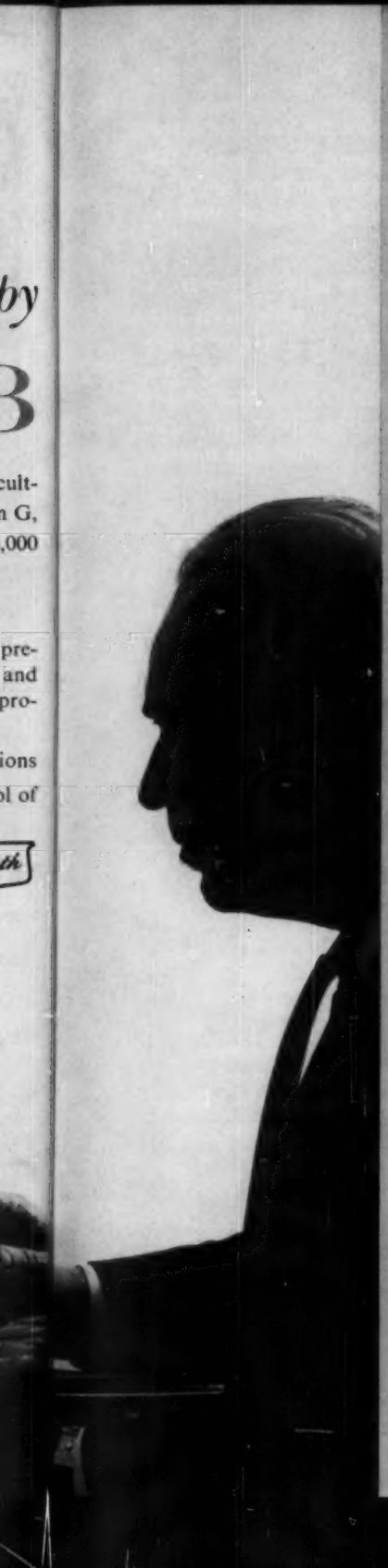

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Clinical Application. The height and duration of blood levels obtainable with BICILLIN P·A·B make this preparation suitable for the treatment of many penicillin-susceptible infections. Blood concentrations averaged 5.39 units per ml. at 3 hours, 0.414 units per ml. at 48 hours, and 0.11 units per ml. at 8 days.[1]

Control of Gonorrhea. BICILLIN P·A·B is especially useful for the community control of acute gonorrhea. Clinical evaluation in five VD clinics resulted in failure rates within 4 weeks of 2% or less in both sexes. Not only is the acute infection cured, but also the BICILLIN component establishes a penicillin protection period of 3 to 4 weeks, during which epidemiological contacts may be located and brought to treatment. The use of Bicillin Injection for the treatment of acute gonorrhea has been reported.[2,3,4,5]

In gonorrheal complications such as arthritis and epididymitis, a single dose of BICILLIN P·A·B is usually adequate.

In cases of gonorrhea in which syphilis is also present, administration of penicillin may prevent the appearance of the chancre and thus mask the first evidence of syphilis. This is not to be falsely construed as benefiting the syphilis. Cases with a suspected primary lesion should have darkfield examinations to verify or exclude syphilis before receiving penicillin, and blood serology should be done monthly for at least 3 months.

Precautions. Note: Allergic reactions to penicillin may occur. The physician should have readily available resuscitative drugs for emergency use. BICILLIN P·A·B should not be used in patients sensitive to procaine; a skin test is recommended to rule out such sensitivity. If sensitivity develops, appropriate measures should be taken. The use of antibiotics may result in the overgrowth of non-susceptible organisms; therefore, constant observation is essential.

Deep intramuscular injection in the upper quadrant of the buttock is preferred. Care should be taken to avoid accidental intravenous administration of penicillin.

Supplied. Each disposable syringe INJECTION BICILLIN P·A·B contains, in a volume of approximately 4 cc., 2,400,000 units of penicillin comprising: 1,200,000 units benzathine penicillin G, and 1,200,000 units procaine penicillin G in a stabilized aqueous suspension with 0.09% methylparaben and 0.01% propylparaben as preservatives.

References. 1. Wright, W.W.; Welch, H.; Wilner, J., and Roberts, E.F.: Body fluid concentrations of penicillin following intramuscular injection of single doses of benzathine penicillin G, and/or procaine penicillin G. Antibiotic Med. & Clin. Therapy *6*:232 (April) 1959.

2. O'Brien, J.F., and Smith, C.A.: Preliminary evaluation of N, N¹dibenzylethylenediamine dipenicillin G in acute gonorrhea in the male. Am. J. Syphilis, Gonorrhea, Venereal Diseases *36*:519 (Nov.) 1952.

3. Hookings, C.E., and Graves, L.M.: Benzathine penicillin G in the control of gonorrhea. Antibiotics Ann. 1956/57 p. 311.

4. Takos, M.J.; Elgin, L.W., and Cato, T.E.: Long-acting penicillin in gonorrhea control. U.S. Public Health Repts. *72*:976 (Nov.) 1957.

5. Schamberg, I.L.; Kalodner, A., and Lentz, J.W.: Antibiotic quarantine of gonorrhea 1. Effect in females. Brit. J. Venereal Diseases *34*:24 (March) 1958.

Although infrequent, adverse reactions to many modern drugs may occur. For further information on limitations, administration and prescribing of BICILLIN P·A·B, see descriptive literature or current Direction Circular.

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Where's the arthritic this morning?

Thanks to Medrol Medules, he woke up comfortable and he's already on the go.

The first long-acting oral steroid, Medrol Medules gives the arthritic patient therapeutic action that continues through the night. In many cases, morning stiffness can become a thing of the past.

The slow, steady release of methylprednisolone often provides greater effectiveness, with less frequent administration and sometimes a reduced total daily dosage.

Many of your arthritic patients, too, can wake up comfortable on Medrol Medules.

Dosage: The following dosages are recommended in rheumatoid arthritis:

	Initial	*Maintenance*
Severe	12 to 16 mg.	6 to 12 mg.
Moderately severe	8 to 10 mg.	4 to 8 mg.
Moderate	6 to 8 mg.	2 to 6 mg.
Children	6 to 10 mg.	2 to 8 mg.

With Medrol Medules, it may be possible to reduce the total daily dose by ⅙.

Indications and effects: Medrol benefits (anti-inflammatory, antiallergic, antirheumatic, antileukemic, antihemolytic) have been demonstrated in acute rheumatic carditis, rheumatoid arthritis, asthma, hay fever and allergic disorders, dermatoses, blood dyscrasias, and ocular inflammatory disease involving the posterior segment.

Precautions and contraindications: Because of Medrol's high therapeutic ratio, patients usually experience dramatic relief without developing such possible steroid side effects as gastrointestinal intolerance, weight gain or weight loss, edema, hypertension, acne, or emotional imbalance.

As in all corticotherapy, however, there are certain cautions to be observed. The presence of diabetes, osteoporosis, chronic psychotic reactions, predisposition to thrombophlebitis, hypertension, congestive heart failure, renal insufficiency, or active tuberculosis necessitates careful control in the use of steroids. Like all corticosteroids, Medrol is contraindicated in patients with arrested tuberculosis, peptic ulcer, acute psychoses, Cushing's syndrome, herpes simplex keratitis, vaccinia, or varicella.

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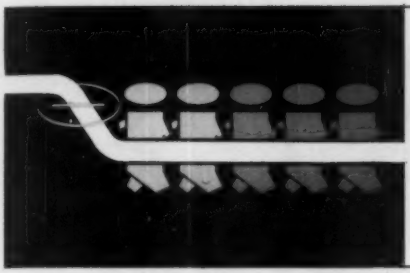
SIDE EFFECTS: In the main, side effects, e.g., hypoglycemia, gastrointestinal intolerance, and neurologic reactions, are related to dosage. They are not encountered frequently on presently recommended low dosage. There have been, however, occasional cases of jaundice and skin eruptions primarily due to drug sensitivity; other side effects which may be idiosyncratic are occasional



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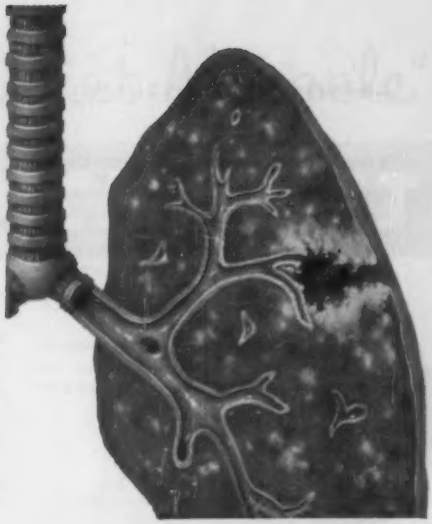

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Viomycin sulfate (VIOCIN) is the crystalline salt of an antituberculous antibiotic derived from the actinomycete, Streptomyces puniceus. In patients resistant to routine agents, VIOCIN provides significant therapeutic effect, particularly in combination with other antituberculous agents. VIOCIN protects against operative complications and is apparently *not cross-resistant with streptomycin or isoniazid.*

INDICATIONS: As an adjunct in the treatment of progressive exudative, hematogenous lesions and the pneumonic type of pulmonary tuberculosis; cutaneous tuberculous lesions and fistulas; tuberculous lymphadenitis; tracheobronchial and laryngeal tuberculosis; alimentary, peritoneal, genitourinary, meningeal, miliary, and bone and joint tuberculosis; and postoperatively in thoracic surgery on tuberculous patients. It is useful prophylactically in operations such as lobectomy and pneumonectomy for pulmonary tuberculosis.

ADMINISTRATION AND DOSAGE: VIOCIN should be administered by *deep* intramuscular injection, preferably into the gluteal, thigh, or deltoid muscles. The dosage employed for most forms of tuberculosis is 2 Gm. (given in two doses of 1 Gm. each, 12 hours apart) every third day, usually in combination with PAS (12 Gm. daily by the oral route). Therapy should be continued for at least four to six months. Daily administration of VIOCIN should never exceed 2 Gm. and should never be given continuously for more than one month.

SIDE EFFECTS: The toxicity of VIOCIN is related chiefly to dosage. When recommended dosages are used, toxic reactions are unlikely to occur with any degree of frequency or severity. They may occur in occasional individuals, however, and the following reactions should be watched for in all patients receiving the drug: renal irritation, disturbances of the eighth cranial nerve, allergic reactions and eosinophilia, electrocardiographic abnormalities, edema and fluid retention, and disturbances in the serum electrolyte pattern.

PRECAUTIONS AND CONTRAINDICATIONS: VIOCIN should be used under the close supervision of the physician, and should not be used when routine measures (as in minimal or primary pulmonary tuberculosis) or other drug therapy (streptomycin, isoniazid, PAS, either singly or in combination) would be effective. Like other antituberculous agents, VIOCIN is of relatively little value in the therapy of extensive caseous or fibrotic lesions. Patients with impaired renal function should receive lower dosages and be carefully watched for signs of toxicity. The similar nature of the toxic manifestations of streptomycin and VIOCIN suggests that these two drugs should not be used concomitantly except when the potentialities of other drug combinations have been exhausted. They should not be used on the same day, and the higher dosage ranges should be avoided.

SUPPLIED: In vials containing the equivalent of 1 Gm. or 5 Gm. viomycin as the sulfate. Diluent to be added.

More detailed professional information available on request.

1. Davey, W. N.: GP 19:107, No. 1, 1959.

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Journal of Public Health

The need for biostatisticians has led to the development of a training grant program by the National Institutes of Health. The consequences so far and the possible results in the immediate future are discussed in this paper. The author also calls attention to the responsibilities of health agencies, official and voluntary, and of professional workers for the success of this endeavor.

THE PROBABLE IMPACT OF THE NIH TRAINING GRANT PROGRAM ON THE FUTURE SUPPLY OF BIOSTATISTICIANS

Emmarie C. Hemphill, M.P.H.

FOR SEVERAL years there has been a national awareness of the critical shortage of individuals scientifically trained not only to apply already existing biostatistical technics but capable of producing new mathematical concepts, formulas, and methodology to contribute to the solution of numerous medical and health problems. It is not necessary to emphasize the acute shortages in biostatistical manpower which are felt by all institutions and agencies concerned with teaching, research, and service. Our topic is rather the discussion of the impact of the NIH training programs—a means which not only promises to provide substantial relief for this situation, but is already making a significant contribution in the manpower "supply market" of the scientific community.

It should be emphasized that the objectives of the training grants administered by the National Institutes of Health relate to the qualitative as well as the quantitative aspects of the problem. That is, not only are these programs devoted to the finding and recruiting of new personnel to receive the very best fundamental training, but provisions are made for advanced training of those already in the field. Such a dual function is essential if there is to be no slackening of pace in the discovery of new and fundamental truths as well as in their application. This is not to imply that training in the past has been inade-

quate, but rather that the intellectual demands (including technical skills and comprehension) placed upon biostatisticians are becoming greater each year. Furthermore, it is imperative that the acquisition of fundamental mathematical and statistical skills be accompanied by training in considerable depth in several of the biological sciences. Without such preparation, the contributions that an individual might possibly make in the advancement of scientific knowledge will definitely be limited. Young predoctoral candidates so trained will be able in their later careers to range widely across such fields as biophysical science, epidemiology, human genetics, public health methods and practice.

If one is to be well prepared in more than one scientific area, no doubt you are asking yourself, "How can such a long period of training be considered in view of the financial requirements?" I would like to point out that, though it is not widely recognized, nevertheless, support for long-term training is now possible if one takes advantage of multiple training mechanisms administered by NIH. For example, a competent young baccalaureate can count on a maximum of 14 years of training, allowing, of course, for competitive review at various levels. A program of this nature might be planned as follows: from three to four years of support are available from either a Direct Predoctoral Research Fellowship or a Traineeship appointment under one of the NIH Training Grants, or any combination of these two mechanisms; an additional three years of postdoctoral support might then be possible by the same means—i.e., a Direct Postdoctoral Research Fellowship or support at the same level on a Training Grant. The next step might be the Special Research Fellowship which, under certain circumstances, may be renewed for a second year. Subsequent to about five years' postdoctoral research training and/or research experience, the same individual might receive a Senior Research Fellowship, which is a five-year award intended to foster additional research in preclinical science departments (including biostatistics departments) in the period between completion of predoctoral training and eligibility for permanent higher academic appointments.

Such extensive support for advanced scientific training was clearly impossible previously. No longer must a qualified individual be dependent on fortuitous support from a collection of research grants. Never before has such breadth of training been possible as is now encouraged in the natural sciences, including mathematics, statistics, physics, and chemistry for workers in the health fields.

It is no longer necessary to justify training in statistics on the basis of its possible use immediately in biomedical researches being undertaken in the medical school environment. As stated before, the need for biostatisticians is acute and is national in scope. A biostatistician is a national asset and can be defended as such. With the advent of computers in biology and medicine, the role of the biostatistician has become even more powerful than it was previously. Biostatisticians should no longer be considered service personnel contributing only valuable aid on biological problems initiated by other scientists. They should be full partners in every sense of the word, and indeed, they should have ongoing research programs of their own which would serve to bridge the gap between biostatistics on the one hand and biomathematics on the other.

With the adoption four years ago of the Senior Research Fellowship Program, it has been possible to establish in schools of public health and elsewhere new faculty positions of associate and assistant professors and instructors. However, only a few half-hearted applications have ever been received. With the advent of the most recent NIH program

for the support of an individual, i.e., the new Career Development Program, it will be possible to establish research professorships in all appropriate research institutions including medical schools, dental schools, and schools of public health.

Our consultants are agreed that the establishment of career positions in this important field of the biomedical sciences would do more to stimulate biostatistics as a science and to encourage the recruitment of outstanding young people than any other mechanism. It now stands as a challenge to the field and to the major figures in the field to capitalize upon these programs and to expand the base of competent younger personnel. Looking forward, it should not be surprising to find in the next generation a proportionally greater sprinkling of senior investigators, research directors, and executives in schools and university circles who have achieved their national distinction through the avenues of academic biostatistics and biomathematics.

I would not have you believe that accomplishments in this field are all for the future. Much has already been achieved as an initial stimulation of and contribution to the field of biometry, and biostatistics in particular. I shall give some concrete examples of the direct impact of these programs, first in terms of institutions, and second, in terms of individuals.

In at least one instance, the very existence of a biostatistics training program in a department of preventive medicine in one of the medical schools has resulted recently in the formal recognition of the disciplinary area and creation of a biostatistics section as a separate entity in this institution. How is one to appraise the probable impact, both direct and indirect, in such a situation? Graduate students, medical students, and even some faculty members who had not previously considered the area of biostatistics as a profession per se are aware as never before of this area of specialization.

In several instances where these training programs are functioning in and through departments of statistics or mathematics, there is an increasing awareness on the part of undergraduate as well as graduate students that the medical and related health fields are an interesting and challenging area in which their knowledge of theory can find application. Through announcements and other recruiting devices employed by the individual program directors in the 17 states in which these 23 biometry training programs are currently operating, many college students are learning for the first time of this heretofore little publicized profession. Not only is this information being disseminated among students in mathematics, but a few students in the natural and social sciences are learning for the first time that biostatistics is an area that should receive serious consideration in their choice of a career. I shall refer later to the fact that more intense activity of this nature must continue if in the future the biological sciences are to receive their just and needed share of outstanding students.

Between September, 1953, and September 1, 1960, 404 different individuals have received support from one of the biometry programs for training periods varying from six weeks to four years. Of those who have completed their training or, for one reason or another, have left the program (183), 32 are now in academic positions; 47 have accepted positions in health departments; 40 are in research positions; and 11 are employed by federal health agencies. To summarize, 130 (or 71 per cent) of the products of these training efforts are already identified with activities related directly to the primary objective of these programs.

The following ranks are held by these

32 in academic positions: one is a full professor; six are associate and 14 assistant professors; and 11 are instructors or lecturers. By type of institution, 21 of these individuals are in schools of public health and 11 are in medical or graduate school teaching.

Of the 47 employed in health departments, approximately one-third (15) are at the director, associate director, or senior statistician grade levels; only seven are serving as statistical clerks. The remaining 25 have positions of intermediate responsibility relating directly to combined research and service. The ratio of these individuals in state versus local health department positions is approximately three to one in favor of the state agency. This appears to be an appropriate distribution in view of the role of leadership that state agencies should assume.

This is a very brief summary of accomplishments to date. "But what of the future impact?" one may ask. I find no difficulty in visualizing that over the next seven to ten years, the total number of these programs can be increased by the addition of one to two new centers per year in which not only the biostatistical but the biomathematical training needs of our future scientists, and specifically of the full-time professional biometricians, can be met. It is quite possible that at least an additional 1,000 young people would thereby receive fundamental training in these centers, with 700-800 subsequently entering full-time scientific careers in the health sciences. If these numbers sound fantastically large, one should consider that even so, the total would not be sufficient to provide one additional biometrician for each research institute, major health agency, or medical center where research and teaching are already under way—much less take into account the number needed for expanded research efforts.

This tremendous job cannot be done, however, by the appropriation of federal dollars alone. There remain much more difficult tasks than the acquisition and administration of funds. These tasks which NIH cannot do and for which the help of professionals in this field is urgently sought are of three separate and distinct types. First, the recruitment of new dedicated people to the field must continue, but at an accelerated pace. In addition, those already in the field must recognize the necessity for advanced training. There is a great deal that those in local and state health departments, voluntary agencies, and educational institutions can do in this area. For example, there are many agencies which have not yet given any of their employees an opportunity to attend the Summer Session in Statistics in the Health Sciences sponsored by the Program Directors of the Biometry Training Grants. Nor have they found it possible to permit periods of leave in which competent staff can participate in one or more of the year-round training programs. I have been informed that several of the summer session courses from which health department personnel could have greatly profited were not crowded. With such opportunities as are provided by these summer sessions, it would seem not unreasonable to expect that within the next five to seven years about three to four statisticians from each of the 50 state health departments will have availed themselves of advanced training which could contribute significantly to planning and executing complex research programs. One of the best ways for health departments to attract and keep competent personnel is to maintain a proper dynamic balance between service and research. Certainly the need for well trained biostatisticians is greater than ever before. Admittedly, the accent here must be put upon the words "well trained."

The second area in which your professional assistance is needed is in keep-

ing standards high. I refer both to training and performance standards.

Third, and equally important, the environment of the scientific community must be made and kept attractive for the young professionals just emerging from these training programs. The new worker in this field must find challenging opportunities that result in satisfying experiences or he will leave the field.

I can think of no group that has a better chance to seize the inside track in this new world of "automata" than the statistician or biometrician. The question is—will the profession carry through with the challenge of providing leadership in the creation of a suitable climate for the future?

It takes more than dollars for stipends and a well staffed training program—it takes vision, hard work, and planning. A spirit of optimism is also essential. Achievement of this goal must not be left to chance.

NOTE: Since presentation of this paper, the Research Career Award Program of NIH has been developed. It merges and modifies the Senior Fellowship Grant, Special Fellowship Grant, and Career Research Professorship Programs. Additional information may be obtained from Dr. Stephen P. Hatchett, Chief, Career Development Review Branch, NIH, Bethesda 14, Md.

Miss Hemphill is executive secretary, Advisory Committee on Epidemiology and Biometry, Division of General Medical Sciences, National Institutes of Health, Bethesda, Md.

This paper was presented before a Joint Session of the American Association of Vital Records and Public Health Statistics, and the Epidemiology, Public Health Education, and Statistics Sections of the American Public Health Association at the Eighty-Eighth Annual Meeting in San Francisco, Calif., November 3, 1960.

1962 Crumbine Competition

All full-time local health departments in the United States are invited to submit entries in the 1962 competition for the national Samuel J. Crumbine Awards, sponsored by the Public Health Committee of the Paper Cup and Container Institute. Two awards are presented each year—one for outstanding achievement in the development of a comprehensive program of environmental health, and the other for outstanding achievement in the development of a program of public food and drink sanitation. Entries in the year's competition must be submitted on or before March 1, 1962. Further information from Crumbine Awards Jury, 250 Park Avenue, Room 1920, New York 17, N. Y.

A study of smoking habits among high school students as related to smoking habits of their parents, and fathers' occupations revealed an increasing proportion of smokers with decreasing social class. Other aspects were studied and the authors discuss their findings with respect to other studies and future research.

CIGARETTE SMOKING AMONG HIGH SCHOOL STUDENTS RELATED TO SOCIAL CLASS AND PARENTAL SMOKING HABITS

Eva J. Salber, M.D., and Brian MacMahon, M.D., F.A.P.H.A.

IN NOVEMBER, 1959, a questionnaire on tobacco smoking patterns was administered to the students of the public high schools (grades 7 through 12) in Newton, Mass. Among other things, information was sought on students' smoking patterns, parental smoking habits, and parental occupation. The present report presents data on smoking patterns in relation to social class, as measured by parental occupation, and on the relationship between parental and student smoking. These relationships are examined using information from the single comprehensive senior high school, which houses grades 10, 11, and 12, corresponding approximately to ages 15, 16, and 17. The student body of this high school has approximately 80 per cent of the Newton population of appropriate age.

Details of this survey will be reported elsewhere, but it should be pointed out that the questionnaires were completed in school time under supervision of the school teachers. The questionnaires were signed by the students but were sealed by them and not opened until they reached the study staff. The students were assured that their answers would not become known to teachers or parents.

The questionnaires were completed by 92 per cent (2,891) of the school's student body. The missing students included those absent from school or excused by the housemaster because of duties elsewhere. One questionnaire had to be excluded because of unstated sex, and five because of unstated smoking habits. In the present analysis an additional 62 questionnaires had to be excluded because of lack of information on parental occupation. The basis of this report is the 2,823 completed questionnaires that remained.

Student Smoking Patterns by Social Class

Families were categorized by social class as judged from fathers' occupations, using the classification of Warner,[1] but on account of the small numbers in the three lowest classes in this community these have been combined. A nonsmoker in this study was defined as a student who in his lifetime had never

smoked ten cigarettes. A discontinued smoker was one who had smoked ten cigarettes at some time in the past but did not at the time of the questionnaire consider himself to be a smoker. A smoker was a student who had smoked at least ten cigarettes in the past and at the time of the questionnaire considered himself to be a smoker, regardless of the amount smoked.

Student smoking patterns in the five social class groups are shown in Table 1. For each sex the percentage of students classified as "present smokers" is highest in the lower socioeconomic groups. On examining social class trends by number of cigarettes smoked, it is evident that they result from a difference between social categories in the proportions of children smoking one or more packs per week; if there is any trend in the proportion of children smoking less than one pack per week it is in the same direction as that for nonsmokers. The proportion of children who smoke from one to four packs, and of those who smoke five packs or more per week, is approximately twice as high in the lowest as in the highest socioeconomic category.

There is little difference between social classes in the proportions of children who are "discontinued smokers." However, the population at risk of discontinuance from smoking comprises the discontinued smokers plus the present smokers, since one cannot discontinue without first having smoked. This population is greatest in the lowest socioeconomic groups. The risk of discontinuance of smoking among children who have smoked must therefore be greatest in the upper social categories,

Table 1—Distribution of Students in Various Social Classes* According to Present Smoking Habits

Sex of Student	Social Class*	Number of Students	Percentage of Nonsmokers	Percentage of Discontinued Smokers	Percentage of Present Smokers	Percentage Who Were Present Smokers of: Less Than 1 Pack per Week	1–4 Packs per Week	5 Packs or More per Week
Boys								
	1	269	41.6	25.7	32.7	9.7	15.6	7.4
	2	317	35.0	27.8	37.2	7.6	20.5	8.2
	3	347	32.8	25.1	42.1	8.4	24.5	9.2
	4	254	31.1	22.0	46.9	10.6	21.3	14.6
	5–7	181	32.0	24.3	43.6	6.1	25.4	12.1
	Total	1,368	34.6	25.1	40.2	8.6	21.3	10.0
Girls								
	1	272	49.6	14.0	36.4	17.3	15.4	3.3
	2	385	50.1	11.2	38.7	16.4	17.7	4.4
	3	372	41.1	12.1	46.8	19.9	22.3	4.3
	4	235	44.3	15.3	40.4	10.6	21.7	8.1
	5–7	191	39.3	13.1	47.6	10.5	28.3	8.9
	Total	1,455	45.4	12.8	41.8	15.7	20.5	5.4

* The social class classification used is that of Warner[1]; 1 is high and 7 is low.
Chi-square for over-all distributions—
Boys: $\chi^2 = 33$, d.f. = 20, $p < 0.05$
Girls: $\chi^2 = 42$, d.f. = 20, $p < 0.01$

Table 2—Percentage of Students in Each Social Class Reporting Parents in Three Categories of Smoking Habits

Smoking Habits of Parents	Parent	Social Class 1	2	3	4	5–7	Total
Regular smoker	Father	42.9	51.9	55.5	62.3	66.2	54.7
	Mother	37.2	44.5	44.6	46.0	36.4	42.3
Smokes sometimes or seldom	Father	18.6	15.8	15.8	11.8	13.9	15.4
	Mother	19.1	18.0	15.8	16.6	16.0	17.1
Nonsmoker	Father	38.5	32.3	28.6	25.9	19.9	29.9
	Mother	43.7	37.5	39.6	37.5	47.7	40.6
Number of students reporting	Father	527	678	695	459	346	2,705
	Mother	535	694	709	483	363	2,784

Smoking habits were unknown because of decease or divorce for 109 fathers and 12 mothers, and were unstated for an additional 9 fathers and 27 mothers.

and shows the same trend with social class as does nonsmoking and the smoking of less than one pack per week.

Parental Smoking Patterns by Social Class

Students were asked to categorize each of their parents as smoking regularly, sometimes, seldom, or never. The proportion of parents so categorized in each socioeconomic group is shown in Table 2.

Approximately equal proportions of mothers and fathers were reported as occasional smokers, but the proportion reported as regular smokers was somewhat higher among fathers than among mothers. Of some interest is the fact that the social class trends are different in the two parents. In the data for mothers, the fluctuations between social classes in the distribution by smoking category are small and show no consistent pattern. However, among fathers, the proportion of regular smokers increases, and the proportion of nonsmokers decreases, consistently and substantially with decreasing social class. There are twice as many nonsmokers in the highest as in the lowest social class. The trend in the proportion of occasional smokers tends to follow the pattern for nonsmokers rather than that for regular smokers, although it is not as striking.

Because of the indirectness of the source of information—children reporting on parents—no attempt was made to ascertain the number of cigarettes smoked by parents.

In Table 3, father-mother pairs are examined with respect to similarity of smoking patterns. To simplify the examination, the class of parents who smoked sometimes or seldom has been omitted. The table shows, in each social class, the proportion of parents categorized as regular smokers in families where (a) the spouse was also stated to be a regular smoker, and (b) the spouse was stated to be a nonsmoker. The results are illustrated in Figure 1. Fathers are more likely to smoke if the mother is a regular smoker, and mothers are more likely to smoke if the father is a regular smoker. These relationships are evident in each social category. The effect of one spouse on the other with regard to smoking habits has no substantial or consistent relationship to social class. The association between social class and paternal smoking pattern exists regardless of whether or not the wife smokes, and the lack of association of maternal smoking pattern with social

class is independent of the husband's smoking habits.

Influence of Parental Smoking on Students' Smoking Patterns

The percentages of students smoking various amounts of cigarettes are given according to smoking habits of parents in Table 4. The influence of parental smoking habits on students' smoking patterns might be expected to be best demonstrated in the examination of families in which (a) both parents are regular smokers, (b) both parents are nonsmokers, or (c) one parent is a regular smoker and the other is a nonsmoker. These groups are separated in the table.

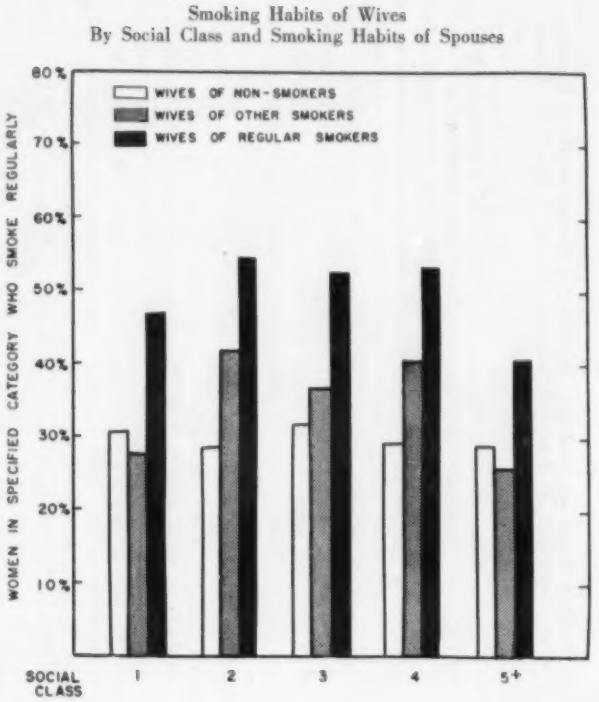
The association of student smoking with parental patterns is quite striking. In families where neither parent smoked, roughly one-quarter of the students were smokers; whereas in families where both parents were regular smokers approximately half the students were smokers In families where only one parent was a smoker and the other a nonsmoker the proportion of smokers among the students was substantially higher than when neither parent smoked and very nearly as high as when both parents smoked.

When these relationships are examined according to amount smoked by the students, somewhat divergent patterns are seen. The percentage of smokers in the lightest smoking category (less than one pack per week) does not vary in any way that suggests the effect of parental influence on student patterns. The percentage of moderate smokers (one to four packs per week) in both sexes is about twice as high in families in which one parent smokes as in families in which both parents are nonsmokers; in neither sex is there a significant difference according to which parent is the smoker, neither is there any difference according to whether one or both parents smoke.

Table 3—Percentage of Students Reporting a Parent to Be a Regular Smoker, According to Reported Smoking Habits of the Other Parent

Social Class	Percentage of Fathers Reported to Be Regular Smokers When the Mother Was Reported as:		Percentage of Mothers Reported to Be Regular Smokers When the Father Was Reported as:	
	Smoker	Nonsmoker	Smoker	Nonsmoker
1	54.1 (196)	31.1 (228)	47.1 (225)	30.8 (201)
2	65.0 (297)	39.5 (253)	55.6 (347)	28.1 (217)
3	66.1 (307)	44.5 (274)	53.3 (381)	32.3 (198)
4	72.2 (212)	49.4 (166)	54.5 (281)	29.4 (119)
5–7	73.8 (126)	60.4 (164)	41.7 (223)	29.4 (68)
Total	65.7 (1,138)	43.7 (1,085)	51.3 (1,457)	30.1 (803)

Figures in parentheses are the numbers of students reporting in the corresponding category.


Smoking Habits of Wives
By Social Class and Smoking Habits of Spouses
WIVES OF NON-SMOKERS
WIVES OF OTHER SMOKERS
WIVES OF REGULAR SMOKERS
WOMEN IN SPECIFIED CATEGORY WHO SMOKE REGULARLY
80%
70%
60%
50%
40%
30%
20%
10%
SOCIAL CLASS
1
2
3
4
5+

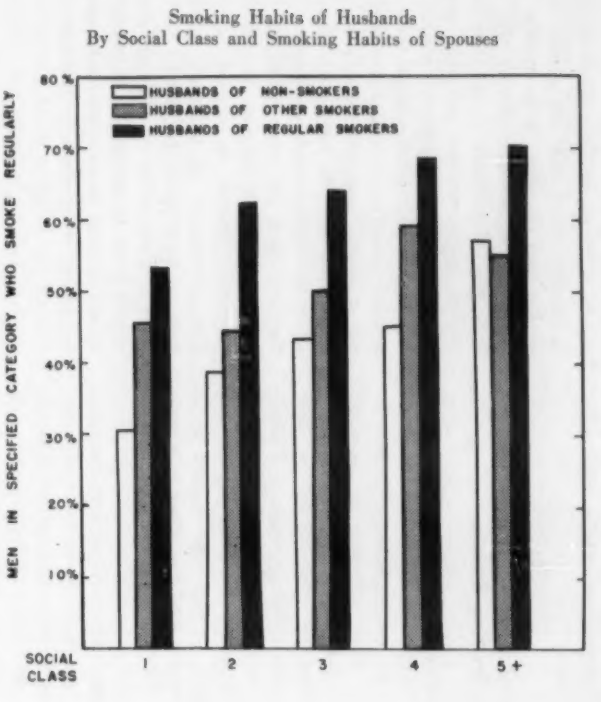

Smoking Habits of Husbands
By Social Class and Smoking Habits of Spouses
HUSBANDS OF NON-SMOKERS
HUSBANDS OF OTHER SMOKERS
HUSBANDS OF REGULAR SMOKERS
MEN IN SPECIFIED CATEGORY WHO SMOKE REGULARLY
80%
70%
60%
50%
40%
30%
20%
10%
SOCIAL CLASS
1
2
3
4
5+

Figure 1

The most striking differences are seen in the proportions of heavy smokers (five packs or more per week). In boys this proportion is more than twice, and in girls more than seven times, as high in families in which both parents smoke as in families in which both are non-smokers. The proportions of heavy smokers among students in families in which only one parent is a smoker lie intermediate between those in the families in which neither or both parents are smokers. There is no consistent tendency for students in this category of smoking to follow the patterns of one parent more than the other. The percentage of girls who are heavy smokers is higher in families in which the father is a regular smoker than in those in which the mother smokes (6.3 per cent and 2.7 per cent, respectively), but the difference is not statistically significant (3.6 ± 2.5).

Social Class, Parental Smoking, and Student Smoking

Since student smoking is related both to social class and to parental smoking patterns, and since parental, or at least paternal, smoking patterns themselves are related to social class, it is important to examine the relationship of student smoking to these two variables simultaneously.

Table 5 shows the percentage of students who smoked one pack or more per week in each social class for each of the four parental smoking categories separated in Table 4. In this analysis, proportions of smokers of one pack or more are shown, rather than proportions of all smokers, since we have seen that the smokers of less than one pack per week do not evidence either the social class trend or the association with parental

Table 4—Percentage of Smokers Among Students According to Smoking Habits of Parents

Sex of Student	Parental Smoking		Number of Students Reporting	Percentage of Present Smokers*	Percentage Who Were Present Smokers of:		
	Father	Mother			Less Than 1 Pack per Week	1–4 Packs per Week	5 Packs or More per Week
Boys							
	Never	Never	224	28.5	7.1	14.7	6.7
	Never	Regular	131	38.2	3.1	25.2	9.2
	Regular	Never	234	42.3	9.0	23.1	10.2
	Regular	Regular	334	48.2	8.4	24.3	15.3
	All other combinations†		445	39.6	10.8	20.4	7.9
	All combinations		1,368	40.2	8.6	21.3	10.0
Girls							
	Never	Never	223	26.4*	13.0	12.1	1.3
	Never	Regular	111	47.7	18.9	26.1	2.7
	Regular	Never	240	43.3	14.6	22.1	6.3
	Regular	Regular	414	51.0	15.5	25.8	9.7
	All other combinations†		467	38.8	17.1	17.6	3.9
	All combinations		1,455	41.8	15.7	20.5	5.4

* Includes those smoking an unknown amount per week (4 boys, 2 girls).
† Includes families in which the smoking history of one or both parents is unknown (145 and 6 families, respectively).

Table 5—Percentage of Students Smoking One Pack of Cigarettes or More per Week, by Parental Smoking Pattern and Social Class

Sex of Student	Parental Smoking		Social Class					
	Father	Mother	1	2	3	4	5–7	Total
Boys								
	Never	Never	25.4 (59)	18.2 (55)	16.7 (54)	23.5 (34)	27.3 (22)	21.4 (224)
	Never	Regular	16.1 (31)	36.4 (33)	47.1 (34)	34.8 (23)	40.0 (10)	34.4 (131)
	Regular	Never	22.9 (35)	29.5 (44)	40.6 (64)	32.6 (43)	35.4 (48)	33.3 (234)
	Regular	Regular	30.2 (53)	36.4 (77)	37.6 (85)	50.7 (71)	41.7 (48)	39.5 (334)
Girls								
	Never	Never	8.5 (59)	11.5 (61)	24.0 (50)	15.2 (33)	5.0 (20)	13.5 (223)
	Never	Regular	25.8 (31)	21.4 (28)	30.0 (30)	50.0 (12)	30.0 (10)	28.8 (111)
	Regular	Never	13.9 (36)	26.8 (56)	34.5 (58)	33.3 (39)	29.4 (51)	28.3 (240)
	Regular	Regular	37.7 (53)	31.0 (116)	29.7 (118)	36.6 (82)	57.8 (45)	35.5 (414)

Numbers in parentheses are the numbers of reports on which the percentages are based.

smoking patterns that the smokers of one pack or more do.

Although numbers are very small in some of the cells of this table, it is clear that the tendency for the proportion of smokers among students to be higher when one or both parents smoke exists in each social class. There is no consistent indication that this association is more marked in any of the social categories examined.

Less clear is the answer to the question of whether there is an association of student smoking with social class that is independent of the association with parental smoking patterns. In order to obtain a summary statement of the trend with social class that is independent of parental smoking habits, expected percentages of smokers in each social class have been calculated. These expected percentages were obtained by applying to the total number of students in each social class and each parental smoking category the percentage of smokers in the corresponding parental smoking category in the "total" (all social classes) column of Table 5. This yields the number of smokers that would have been expected in that social class had there been no influence of social class on student smoking other than that operating indirectly through the variation in parental smoking habits with social class. When these numbers are related to the total students reporting in that social class, expected percentages are derived.

In Table 6, expected and observed percentages are compared. In both sexes

a distinct trend with social class is evident in the ratio observed/expected, suggesting that the social class trend in student's smoking is independent of parental smoking patterns. In fact, the social class trend in the expected percentages, which gauges the extent to which variation in parental smoking with social class may produce a social class trend in students' smoking habits, is very small, and suggests that this mechanism does not account for more than a quarter of the excess of student's smoking that is seen in social classes 5-7 compared to social class 1.

Discussion

The only other data on the relationship of smoking patterns to social class in the United States are those reported on the national probability sample of Haenszel, Shimkin, and Miller.[2] These authors noted evidence of a socioeconomic trend among employed males similar to that noted here. This was evidenced, for example, by a lower percentage of current regular cigarette smokers among professional workers (43 per cent) than among nonfarm laborers (54 per cent), and a lower proportion among farmers (40 per cent) than among farm laborers (51 per cent). These authors noted that the socioeconomic gradient is less clear when heavier smoking patterns are examined, a procedure that we were not able to undertake. Certainly some contradictory trends are evident in their data, but we may note that the proportion of professional workers smoking two packs of cigarettes or more daily (0.7 per cent) was about half that for all employed males (1.2 per cent).

Haenszel, et al., found no appreciable socioeconomic gradient in the smoking habits of females employed outside the home. Our own findings suggest that the same situation exists for women employed at home when classified according to the occupation of the husband. The discrepancy between males and females in the association of smoking habits with social class is of some interest.

The sample examined by Haenszel and his co-workers was restricted to persons 18 years of age or older. The authors were therefore not able to examine student smoking patterns by social class. Our data suggest that the social class trends in smoking habits of high school students are similar to, though not quite so striking as, those for adult males. It is also of interest that, unlike their mothers, female students show the same social class trends in smoking habits as do their male contemporaries.

The relationship between parents' and

Table 6—Ratios Between Observed and Expected Percentages of Students Smoking One Pack or More per Week, as Derived from Table 5

Social Class	Boys			Girls		
	Observed	Expected	Ratio	Observed	Expected	Ratio
1	24.7	31.4	0.79	21.2	25.6	0.83
2	30.1	32.6	0.92	24.5	28.1	0.87
3	35.0	33.0	1.06	29.7	28.8	1.03
4	38.6	33.7	1.15	32.5	29.0	1.12
5–7	36.7	33.7	1.09	35.7	28.6	1.25
Total	32.8	32.8	1.00	28.0	28.0	1.00

Expected percentages are derived by applying the percentages of smokers of one pack or more per week in each of four parental smoking categories to the number of students in each parental smoking category in each social class. The data are restricted to the four parental smoking categories shown in Table 5.

Table 7—Percentage of Student Smokers in Three Studies According to Parental Smoking Habits

Study	Parent a Current Smoker				Total
	Both Parents	Father Only	Mother Only	Neither Parent	
Horn, et al.:					
Boys	31.9	26.3	23.6	16.7	25.8
Girls	18.5	12.4	18.1	6.8	13.6
Bothwell:					
Both sexes:	22.6	16.1	23.3	15.0	18.9
Present study:					
Boys	49.1	43.2	38.2	28.5	41.2
Girls	52.2	43.3	47.7	26.4	42.5

students' smoking habits has also been examined by Bothwell[3] and Horn, et al.[4] A summary of data from the three studies is given in Table 7. Results of the three studies are in agreement with respect to the striking difference that exists between families in which both parents smoke and those in which neither parent smokes, but differ regarding the apparent influence of one or the other parent. Thus, the data of Horn and his colleagues suggest that the influence of each parent is distinct, and the proportion of student smokers in families where both parents smoke is substantially higher than in those in which only one parent smokes. For girl students the proportion of smokers in families in which only the mother smokes is significantly higher than in those in which only the father smokes. Among boys, the proportion of smokers is somewhat higher in families where only the father smokes than in those in which only the mother smokes, but the difference is not significant.

Bothwell's data, unfortunately, are not separated by sex. They indicate a substantial influence of maternal smoking, but no relationship to paternal habits. The proportion of student smokers is no higher in families in which the father smokes than in families in which neither parent smokes, and no higher in families in which both parents smoke than in those in which only the mother smokes.

As already noted, our own data suggest an independent effect of each parent, regardless of sex of the student, with highest proportions of student smokers being in families in which both parents smoke.

Age of the students must be considered as possibly contributing to some of these discrepancies. Most of the students studied by Bothwell, for example, were between 11 and 15 years of age, while the age range in our own data and in the Horn study was somewhat higher —14 to 17 years. It is possible that family cultural patterns, related to ethnic background, socioeconomic status, and religion, for example, may also account for some of the discrepancy—certainly such differences would be expected in school populations as widely separated as Oxfordshire (England), Portland (Ore.) and Newton (Mass.). It is planned to extend the present study to include younger age groups and to include interviews with, and psychologic tests of, a sample of students and parents. Such studies may provide information bearing on the factors contributing to the mechanism of the association between parental and student smoking patterns,

and on the reasons for the differences noted between the three studies to date.

Summary

At the Senior High School, Newton, Mass., 2,823 students answered a questionnaire including among other items the students' past and current smoking habits, current smoking habits of the parents, and fathers' occupations.

The proportion of students who were currently regular smokers, and particularly of those who smoked one pack of cigarettes or more per week, increased with decreasing social class as measured by father's occupation. This trend was seen for both male and female students. The proportion of fathers who were reported as regular smokers showed a similar relationship to social class, but the proportion of mothers who were smokers did not vary by social class.

The proportion of students who were smokers, and particularly who were heavy smokers, was high in families where both parents were regular smokers (51 per cent and 13 per cent, respectively) and low in families where neither parent smoked (25 per cent and four per cent). Student smoking in families in which only one parent smoked was intermediate in frequency between these extremes; it did not appear to be significantly related to sex, either of the student or of the parent.

These two associations were independent. That is, social class and parental smoking habits were each related to student smoking habits when the other was held constant.

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Dr. Salber is research associate, and Dr. MacMahon is professor of epidemiology, Department of Epidemiology, Harvard University School of Public Health, Boston, Mass.

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This paper explores the application of the RPCF test in the serodiagnosis of syphilis in the public health laboratory. The test is evaluated and the limits of its use are indicated.

PROBLEMS IN THE USE OF THE RPCF IN A PUBLIC HEALTH LABORATORY

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CURRENT interest in the serodiagnosis of syphilis has been directed to the development of a test to replace the specific but expensive and time-consuming TPI (Treponema pallidum immobilization) test. The technic which has recently received the most attention in this connection is the complement fixation test using a protein extract of the Reiter strain of treponemes as the antigen (RPCF).

The chemical fractionation of the Reiter treponeme by D'Alessandro and his co-workers in Italy in the early 1950's[8,9] provided the basis for subsequent work with the Reiter protein antigen. Several investigators have contributed further to our knowledge of the antigens of this organism.[7,10,13] Clinical evaluations of the RPCF test have been reported by several authors[6,11,14,16,19,22,-24,26] and a number of different technics for the performance of the test have been described. However, many questions regarding the test and its practical application still require answers. How may the test best be utilized in a public health laboratory? Is the test an adequate screening method for subsequent TPI testing? Is this test sufficiently specific and sensitive to replace the TPI? Are results of this test reproducible when the same serum is retested on a different testing day?

It was in an attempt to supply some of the answers to these questions that the Microbiology Laboratory of the California State Department of Public Health undertook the studies described in this paper. In general, these studies relate the performance and reactivity of the RPCF test to the TPI and VDRL tests on specimens from several categories of patients.

The VDRL slide test was performed as described in the 1959 Manual of Serologic Tests for Syphilis.[15] The RPCF technic used was the 1/5 volume Kolmer technic described in the same source, except that saline containing optimal amounts of calcium ion as well as magnesium ion was used.* The TPI technic used is that of Nelson as modified by Harris and associates.[15] The technics for each of the tests were the same for each study. One lot of commercial RPCF antigen was used throughout to eliminate possible variation due to antigen differences. In each of the studies the RPCF test was performed on the same serum on each of two different days in an effort to determine reproducibility of the

* 100 mg $MgCl_2$ and 40 mg $CaCl_2$ per liter of 0.85 per cent saline.

Table 1—Routine Study, Results of RPCF and VDRL Tests on 200 Specimens Received for Routine Serologic Testing

VDRL	RPCF*	Number	Per cent
Agree			
R†	R	7	3.5
N	N	187	93.5
Disagree			
R	N	4	2.0
N	R	0	0.0
R	AC	0	0.0
N	AC	2	1.0
Total		200	100.0

* RPCF results first testing day.
† R = Reactive and weakly reactive.
N = Nonreactive.
AC = Anticomplementary.

RPCF test on specimens derived from various categories of patients.

Study I—Routine Study

This study was designed to determine the RPCF reactivity level on specimens received in this laboratory for routine lipid serologic tests for syphilis (STS).

Two hundred specimens received for routine STS from physicians in a city of 110,000 were selected on the basis of adequate serum volume. VDRL and RPCF tests were performed. It is evident in Table 1 that test results on 97 per cent of the specimens are in agreement. For purposes of simplification in this table, weakly reactive (WR) and reactive test results are grouped as reactive. The specimens which show discrepant results between tests (4/200 or 2 per cent) are all in the reactive VDRL and nonreactive RPCF category. TPI tests were performed on these four specimens. One specimen was TPI nonreactive in agreement with the RPCF test. The other three were TPI reactive in agreement with VDRL results.

The reactivity rate of RPCF in this group of specimens is 3.5 per cent, while the rate of reactivity of the VDRL was 5.5 per cent. In this predominantly nonreactive group of specimens, reproducibility of the RPCF is good. Exact agreement of results between runs was obtained in 97 per cent of the specimens.

Study II—Reactive Group

This second study was designed to determine the agreement between VDRL and RPCF tests on specimens selected on the basis of VDRL reactivity.

Specimens were obtained from private physicians and local health departments in counties of the state for whom this laboratory was currently performing routine serologic tests for syphilis. Serum specimens showing any degree of reactivity in the VDRL test were frozen in aliquots for testing by the RPCF and TPI technics. Serums from all reactive VDRL specimens were tested by the RPCF test in each of two different test runs. Any specimen which showed a difference in result of WR or greater between RPCF test runs was tested a third time. A consensus result was then used for comparison with VDRL and TPI. Any specimen showing a discrepant result between the VDRL and RPCF was tested by the TPI technic.

Results of comparison of VDRL and RPCF are reported in Table 2 (A). Sixty-six per cent or 120 of 182 specimens showed agreement between the two tests if reactive and weakly reactive results are grouped. Sixty-two serums gave discrepant results between the VDRL and RPCF tests. TPI tests were performed on these 62 specimens and results are given in Table 2 (B). Forty-six of these 62 serums were reactive in both the VDRL and TPI tests but nonreactive in the RPCF test. The remaining 16 serums were negative in the RPCF and TPI tests but reactive in the VDRL.

Reproducibility of RPCF results in

Table 2—Reactive Study

(A) RPCF Test Results on 182 VDRL Reactive Specimens

Results	VDRL Reactive Specimens* (182)	
	Number	Per cent
RPCF R*	120	66
RPCF N	62	34
Total	182	100

* Includes WR.

(B) TPI Test Results on 62 Specimens with Discrepant Results Between RPCF and VDRL Tests

Results			Number	Per cent
VDRL	RPCF	TPI		
R	N	R	46	74
R	N	N	16	26
Total			62	100

this group of specimens was considered poor. Only 75 per cent of the specimens repeated in a second test run showed exact agreement of results. Possible reasons for this lack of reproducibility will be discussed later.

Study III—Prenatal Study

In an effort to answer questions regarding the use of RPCF tests in serologic testing of prenatal patients the following study was undertaken (see Table 3).

One hundred and forty-eight prenatal specimens received in this laboratory for TPI testing were also tested by the VDRL and RPCF technics. In considering results of this study it must be realized that these serums represent specimens from prenatal patients with reactions to some type of STS in some laboratory during the course of the current pregnancy, since this is the criterion upon which the TPI testing service is based.

In this group, the VDRL and RPCF tests are in agreement in 91 of the 148 specimens tested or 62 per cent. In three of these 91 specimens, the TPI disagreed with the VDRL and RPCF. This represents less than 2 per cent of the total specimens in this study. Of the remaining 57 specimens showing discrepant results between VDRL and RPCF, the TPI agreed with the RPCF in 43 and disagreed in 14. All 14 disagreements were in the category of nonreactive RPCF and reactive TPI.

Reproducibility of the RPCF test in the prenatal group was good. Ninety-one per cent of the specimens showed exact agreement of results between two test runs.

Study IV—BFP Study*

Study IV represents tests on a group of 227 specially selected cases. The specimens consisted of serums submitted for TPI testing where the physician considered that the reactive STS results obtained did not indicate syphilis. No clinical or historical evidence of syphilis was indicated, treatment directed toward syphilis had not been administered, and the patient had shown reactivity in one or more of the STS for at least three months prior to the submission of the current specimen.

Specimens selected for this study were tested by the VDRL, RPCF, and TPI technics. RPCF tests were performed on each serum on each of two testing days. A third test was performed if the first two were not in agreement. A consensus report was used for comparison with VDRL and TPI tests. The VDRL and the RPCF were in agreement in 117 or 52 per cent of the 227 specimens tested (see Table 3). In five of these 117 specimens, results of the VDRL

* Biologic false positive study.

and RPCF disagreed with the TPI. This represents 2 per cent of the total specimens in this study. Of the 110 specimens showing discrepant RPCF-VDRL results, the RPCF agreed with the TPI in 81 and disagreed with the TPI in 29. Of these 29 specimens, 27 were in the category of nonreactive RPCF and reactive TPI. The reproducibility of the RPCF tests on specimens in this category was 88 per cent.

Discussion

At the beginning of this paper, a series of questions was presented regarding the application of the RPCF. These questions will now be considered in view of the studies just described.

1. Is the RPCF Sufficiently Sensitive and Specific to Replace the TPI?

Because of the well known difficulties in making a definitive diagnosis in many cases of syphilis, the TPI, which possesses a high degree of sensitivity and specificity, has come to be generally accepted as the standard of reference against which new treponemal tests are evaluated.

In the two studies where the TPI was performed on all specimens (Prenatal and BFP Studies) the RPCF showed an over-all agreement with TPI of 87 per cent. In these groups the RPCF showed a high degree of agreement in nonreactive TPI specimens for a specificity of approximately 98 per cent. Here, we are defining specificity as per cent agreement with nonreactive TPI specimens and sensitivity as per cent agreement with reactive TPI specimens. The sensitivity of RPCF in the prenatal group was 64 per cent and in the BFP group 73 per cent. This lack of sensitivity is also indicated in the Reactive Study, Table 2 (B). Of the 62 serums which showed discrepant results between VDRL and RPCF and which were tested by TPI technic 46 (or 74 per cent) were nonreactive RPCF with reactive TPI.

Disagreements between RPCF and TPI tests may be attributed to the antibody status of the patient, since it is well known that the TPI is usually nonreactive in early syphilis and remains

Table 3—Results of VDRL, RPCF, and TPI Tests on Selected Specimens Submitted for TPI Testing

Test Results			Prenatal (Study III)			BFP (Study IV)		
VDRL	RPCF	TPI	Number		Per cent	Number		Per cent
VDRL and RPCF Agree								
R	R	R	26		18	77		34
N	N	N	62	91	42	35	117	16
					62			52
R	R	N	2		1	2		1
N	N	R	1		<1	3		1
VDRL and RPCF Disagree								
R	N	N	42		28	78		34
N	R	R	1	57	<1	3	110	1
R	N	R	14		10	27		12
N	R	N	0		0	2		1
Total			148		100	227		100

reactive longer than other tests in treated syphilis. However, early syphilis and treated syphilis can be reasonably excluded in the BFP group because of the basis of selection of the specimens. The specimens were from patients with no stated history of syphilis who had had reactive STS at least three months prior to the current specimen and who had received no treatment for syphilis. It is evident that under conditions of testing in this laboratory, the RPCF shows a lack of sensitivity which makes it an unsatisfactory replacement for the TPI test.

2. Is the RPCF an Adequate Screening Method for the TPI?

Investigators[16,22] have suggested use of the RPCF together with one or more lipid tests as a preselection procedure for the TPI. This procedure would presumably eliminate the necessity of performing TPI tests on specimens where RPCF and lipid tests agree.

Results of the studies reported in this paper indicate that use of the selection method employing a combination of the VDRL and the RPCF tests would eliminate the necessity of performing 66 per cent of the TPI's in the Reactive Study, 52 per cent in the BFP Study, and 62 per cent in the Prenatal Study. The possible limitations of such a screening procedure must be recognized. The TPI will disagree with the results of the screen in a small percentage of the specimens showing agreement between the VDRL and RPCF (about 2 per cent of those reported here). We hope over a period of time to be able to determine the significance of these discrepancies. At the present time we can only state that they exist.

3. How May the RPCF Test Be Best Utilized in a Public Health Laboratory?

A review of the results obtained in the Routine Study indicates that the RPCF would offer little additional information over routine lipid tests in unselected "routine" specimens received for serologic testing. On problem serums, the test does not possess sufficient sensitivity to replace the TPI. It has been shown that the test in conjunction with the VDRL may be of value as a screen for the TPI. We feel that its true value in this respect will not be determined until an adequate evaluation can be made of the relatively small number of discrepancies between the screen and the TPI.

4. Are Results of the RPCF Reproducible?

Reproducibility or precision is an important consideration in the evaluation of any serologic technic. In the case of the treponemal tests it assumes added importance because of the reliance placed on the test result in establishing a diagnosis of syphilis. The TPI has been shown to possess a satisfactory reproducibility.[2,4,17,20,23,25] In the studies reported here the reproducibility of the RPCF varies considerably depending upon the type of specimen tested (Table 4).

In the Routine Study RPCF reproducibility is high with 97 per cent of the serums giving the same result on repeat testing. This is not surprising since 96 per cent of the specimens in this group were nonreactive and would be expected to yield highly reproducible results. As the proportion of reactive specimens increases in the study groups, reproducibility decreases. The Prenatal group with 20 per cent reactive RPCF specimens gave a reproducibility of 91 per cent. The BFP group, where approximately one-third of the specimens showed some RPCF reactivity, had a reproducibility of 88 per cent. In the Reactive group, where the opportunity for disagreement is even greater with two-thirds of the specimens showing some RPCF reactivity, RPCF reproducibility drops to 75 per cent.

It is known that in any serologic test the most difficult results to reproduce are

intermediate reactions. The reproducibility of a test is closely associated with the number of such reactions obtained. Previous work in this laboratory[4] has shown that only a small number of specimens tested by the TPI technic fall into this category. It is of interest to note that the number of weak reactions in the TPI on the group of specimens reported here is less than 10 per cent. In the RPCF in our hands approximately two-thirds of the reactions fall into the intermediate category, i.e., reactions other than negative or four plus. This large number of intermediate reactors undoubtedly contributes heavily to the general lack of reproducibility of the RPCF. Improvements in the RPCF antigen or changes in test technic could conceivably improve test reproducibility. Until such improvements are made, our experience suggests that the accuracy of the RPCF report can be improved by testing specimens on each of two testing days. If discrepancies occur, a third test should be performed and the report based on the three test results.

We have been discussing some of the problems encountered in the use of the RPCF test dependent upon types of specimens tested. There are further problems which may influence the type of reproducibility and reactivity obtained. These problems are technical in nature and should be carefully assessed before this procedure gains wide acceptance.

At the present time, at least three different technics for use with Reiter protein antigen are employed in the United States—the 1/5 volume Kolmer (KRP) as described by Bossak,[3] the 1/5 volume technic using one and one half units of complement as described by Portnoy and Magnuson,[21] and the 50 per cent end point technic of De Bruijn.[12] Bekker[1] recently reported on a comparison of these methods and advocated use of the technic employing one and one half units of complement as the most satisfactory from the standpoint of sensitivity and specificity. However, brochures accompanying RPCF antigens from various commercial sources and the USPHS Manual of STS[18] recommend use of two units of complement in the 1/5 volume Kolmer method. Use of a single technic throughout the country is desirable, but little work has been published regarding determination of the most satisfactory one.

The differences in RPCF technics have another significant facet. It is axiomatic that complement fixation methods utiliz-

Table 4—Reproducibility of RPCF Test Results on Four Study Groups

Type of Test Agreement \ Study Group	Routine (Study I)		Prenatal (Study III)		BFP (Study IV)		Reactive (Study II)	
	No.	%	No.	%	No.	%	No.	%
Exact agreement R→R; WR→WR; N→N	192	97	133	91	205	88	149	75
Partial agreement R→WR; WR→R	4	2	6	4	10	4	14	7
Partial disagreement WR→N; N→WR	1	<1	0	0	11	5	21	11
Complete disagreement R→N; N→R	0	0	7	5	6	3	15	7
Total	197	100	146	100	232	100	199	100

ing different amounts of complement will give different degrees of sensitivity and specificity. One must bear this in mind in comparing the work of investigators when different technics are employed.

Another difficulty was experienced by this laboratory soon after work began with the RPCF test. Very rapid clearing and reading times were obtained using the recommended control serum pattern as the basis of determining secondary incubation time. This rapid clearing was usually associated with low-complement titers. Similar difficulties experienced previously with full volume Kolmer tests were corrected by the addition of optimal amounts of calcium ion to the Kolmer saline.[5] When this saline was utilized in RPCF tests, secondary incubation times were increased and "valid" test runs were obtained as defined in the 1959 Manual of STS[18] (i.e., the expected pattern of the control serum was reached at least ten minutes after hemolysin controls cleared).

Serums of the Prenatal and BFP Study groups were tested in parallel with saline containing magnesium ion and no added calcium ion and with saline containing optimal amounts of both magnesium and calcium ions. Little variation of results of tests on serums so treated was obtained. When a difference in reaction occurred, the results of tests performed with saline containing added calcium and magnesium ions were in closer agreement with the TPI result than were results obtained using saline with only added magnesium ion.

Differences in the reactivity of different batches of RPCF antigen may well present an added problem in any evaluation of the RPCF test. The results of parallel testing of a limited number of serums in this laboratory indicate that antigens from different sources may vary in reactivity. Added problems may be presented by the deterioration of antigens. These problems indicate areas for further investigation.

Summary

In this paper we have explored the application of the RPCF in the serodiagnosis of syphilis in the public health laboratory. Evaluation of RPCF test results in four diagnostic categories of patients is described. It is emphasized that the sensitivity and reproducibility of the test is dependent upon the choice of diagnostic categories selected for study. The value of the RPCF appears to be limited by a lack of sensitivity and reproducibility in certain groups of patients. Because of lack of test sensitivity the RPCF alone is not a satisfactory replacement for the TPI. Use of the RPCF test in conjunction with a standard lipid test as a screening procedure for the TPI has been suggested. Evaluation of the small percentage of cases where the lipid test and the RPCF test are in agreement with each other but disagree with the TPI is necessary before full acceptance of this application of the test can be made. It is possible that with certain technical improvements eliminating the difficulties suggested in this study, the RPCF test may have a wider application than is indicated under current conditions.

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Messages are often misinterpreted and communication fails because no account is taken of the processes involved, especially in interprofessional communication. In this paper the author analyzes the significant processes involved and suggests ways of dealing with the problem.

INTERPROFESSIONAL COMMUNICATION

Lawrence K. Frank, A.B., L.L.D.

IT HAS BEEN assumed that anyone who can speak or write could communicate but, as we now realize, human communication is a complex and difficult process, subject to a variety of blocks and distortions. Indeed, the more we consider human communication, the more astonishing it becomes that we can and do communicate to the extent we do.

Thus, a person wishing to communicate a query, a statement, or a greeting to another must send some kind of message. This message must then be transmitted by voice directly or by some device—written or by a special set of symbols designed to simulate verbalized symbols. Transmission of a message may be difficult and unsatisfactory—the articulation of the words, with different accents, dialects, and especially the use of special words known only to the sender, and his occupational or professional group may give rise to a message that is adequately coded from the point of view of the sender but not for the intended recipient.

Having listened and received the message, the recipient must then give the message the meaning which it has for him. In this process he may often distort or misinterpret the message. This distortion and accompanying misunderstanding occur whenever an individual with his specific experience and training receives a message from another individual with different experience or training who uses verbal and other symbols he does not recognize or cannot interpret correctly.

We see, therefore, that the simple act of verbal communication is often frustrating to both sender and recipient, and gives rise to misunderstanding and sometimes resentment as each considers the other stupid or careless or deliberately obscure.

In verbal communication, there are further complications. We think and articulate messages in words and sentences that are then vocalized. While we are speaking, we, of necessity, use varying tones of voice, with changing facial expressions and gestures and altered bodily postures which usually are exhibited with little awareness that we are sending these nonverbal messages, along with the verbalized messages. Sometimes the tone of voice conveys a message that is contributory to the verbalized message or detracts from and alters or even negates its meaning. Sometimes our gestures re-enforce or weaken the verbalized message, as do our facial expressions. These nonverbal messages often provoke emotional reactions of which neither sender nor recipient is aware.

Human communication, therefore, is a complex, difficult, and often unreliable transmission of messages when spoken and also liable to distortion when written.

Some years ago Norbert Wiener remarked that the world may be viewed as

a myriad of to-whom-it-may-concern messages. Each organic species is equipped to receive and to respond to those messages for which it has a built-in concern in order to survive. Man has greatly enlarged his concerns with new awareness and patterned perception.

Each scientific discipline has cultivated a special concern for its highly selective focus on the universe with its patterned perception of those messages, dimensions, or operations of the world for which it has a special competence. Each of these scientific groups also has developed its own symbol system, its verbal and nonverbal symbols for intergroup communication and for thinking and reflecting and reporting its studies and experimentations, as in mathematics and symbolic logic.

Each profession and each specialized occupational group has its own, often highly specialized, conceptual framework, what it believes, assumes, and takes for granted, its specific ways of thinking, observing, measuring, judging and evaluating situations, events, organisms, persons and their behavior. Each operates with its own conception of human nature and assumptions about human conduct. Each profession has also developed its own specialized vocabulary and language for intraprofessional communication, frequently relying upon abbreviations, esoteric signs and symbols that are familiar only to members of that profession.

Here we see how the actual world of events of plants, animals, organisms, and persons has become allocated among a variety of professional and vocational practitioners, each of which has been trained to focus upon those dimensions of the world and its components and relations which that profession has selected for observation and concern, ignoring all else in its single-minded preoccupation with its own tasks, problems, and practices.

Moreover, members of each professional group learn to think in a specialized way so that they will think, speak, and act in the patterns which their profession has developed and sanctioned as its appropriate mode of operation and communication.

In the several professional schools, the student must learn to stop thinking as a naive, untrained layman; indeed, until he can free himself from traditional assumptions and customary and habitual modes of perceiving and thinking, he cannot begin to master the professional practice he hopes to attain.

The law student, for example, must learn to ignore and reject the familiar workaday assumptions and expectations, and acquire the prescribed patterns of legal thinking and conceptualization of situations, more especially of human behavior and relations. The lawyer thereby becomes a specialist in converting all human behavior, and especially disagreements and conflicts, into a series of symbolic relations, concerned with rights, titles, obligations and interests.

The medical student, likewise, must overcome all his previous feelings and beliefs about organisms, give up the folklore and lay assumptions about the human body and disease so that he can learn to think in terms of physiological and pathological processes, of organ systems and their functioning, of symptoms and disease categories, mastering the orientation and the language which distinguishes medicine from all other professions.

We may think of each profession and scholarly group as creating an "as if" world of its own group activities. Or to use a phrase proposed by Suzanne Langer for the arts,[1] each group has established a "virtual world," which is not a representation of the actual world, but an imaginatively created conceptual world that exhibits whatever that group believes is significant and worth their persistent concern and efforts to master.

The world of actuality becomes a reservoir from which each discipline extracts its self-selected objects and events for study and exercise of its conceptual patterns and technics.

Caught in our several "virtual worlds" and handicapped by our specialized language and conceptual frameworks, we face many exigent problems and urgent tasks that exceed the capacity of any one discipline or profession to cope with adequately. These problems are multidimensional, or at least arise in multidimensional contexts, in terms of which they must be approached if we hope to deal with them adequately. They are "organized complexities," as Warren Weaver has so aptly named them.[2]

Today ever more frequently executives and administrators in government, business and industry, education and other organized activities and institutions are confronted with problems of organized complexity and the necessity for making decisions that demand recognition of these many dimensions or facets. They are looking to professional practitioners and investigators to advise them, often making available generous funds for research.

But in accordance with our customary organization and practice of research, these studies are usually entrusted to one discipline or profession, depending upon how the administrator views his problems. These investigators, with commendable zeal and conscientious devotion to the assumptions and methods of their disciplines or professions, proceed to study the problem by analyzing it into variables and collecting the data which their training has made them competent to gather and to interpret. Out of these studies come papers, monographs and reports that are highly regarded by members of the discipline or profession as contributions to their field.[3]

But rarely do these studies provide the administrator with an adequate basis for decision, for planning or operations, and rarely do they answer the questions he has asked.

No human or social problem is ever unidimensional in the sense that it can be formulated or studied in terms of the relation of two variables by the conceptions and methods of any one discipline or profession, or evaluated by one set of data. Thus, an economist may be asked to make a quantitative study of a situation that has been called an economic problem because the most acute conflicts or difficulties appear in economic activities, or the administrator sees the situation as purely economic. The economist then reports his findings and often offers recommendations and formulates directives for the nation, the state or local area, primarily, if not exclusively, in terms of economic concepts and assumptions.

Likewise, a political scientist, a sociologist, a lawyer, a psychologist, or an anthropologist will operate in a similar way, each one approaching multidimensional social situations and human problems in terms of his specialized focus, methods, and ways of thinking. We might say that each converts a problem into the kind of formulation he is accustomed to work with, ignoring what lies outside his concerns or conceptions. Engineers also approach problems and projects in terms of their engineering competence, thus often completely ignoring the social and human consequences of their projects.

As we have begun to realize, these unilateral studies and recommendations ignore the consequences of their proposals except as envisaged by the specialized interests of the investigator. Thus, the social, political, legal, religious, family, and neighborhood dimensions of a situation confronting a public health officer may involve consequences exceedingly serious for the public health program. But the specialist is not trained to think of these consequences, or even to recognize that they may be involved

in his findings and recommendations. He is not competent to envisage their occurrence because of his preoccupation with his professional concerns and symbols, and his inability to think except in terms of his professional concepts and familiar assumptions.

This development of increasingly specialized concerns and endeavors, with almost impassable boundaries between these several virtual worlds, has been immensely productive. Indeed, it has become almost necessary for an individual in any one of these fields to focus almost exclusively upon the problems and the methods of his field in order to keep abreast of the rapid changes and advancing frontiers in his profession or discipline.

Many are persuaded that this development of increasing specialization is unavoidable and indeed is necessary and desirable if science, scholarship, professional knowledge and practice are to advance.

Many attempts have been made to develop interdisciplinary studies or multidiscipline projects which to date have rarely been fruitful. Members of each discipline come together and talk at each other but do not communicate, even when they earnestly try to make themselves clear and avoid undue technical terminology. What seems to be the major block to such interdisciplinary communication is not always recognized, namely, the different conceptual frameworks which each discipline utilizes in its work and in its thinking and communicating. It is not so much the language they use but rather their different ways of conceiving and perceiving events, without which their language may communicate no meaning.

Approached from this angle, we might say that the major obstacle to attempted communication among disciplines and professions is not only the language but the concepts and assumptions, the criteria of credibility which each participant relies upon in his work and uses in his thinking and attempted communication. These often unspoken assumptions, these rarely formulated preconceptions, are taken for granted by the members of each group who imply but do not explicitly disclose them in their attempts at communication. But the recipient of these messages, with his own conceptual framework, his professional assumptions and his criteria of credibility, must interpret any message in his own conceptual framework and by so much distort or even wholly negate that intended message.

In a group of individuals from different disciplines or professions, each to a large extent is talking to himself, not realizing that what he is saying conveys little or no meaning or is being interpreted by the others according to a different frame of reference, with different concepts and assumptions and criteria of credibility.

Obviously if each person in a team of interdisciplinary or interprofessional practitioners relies upon the concepts and assumptions of his discipline or profession and expresses these in whatever he says and does, his attempts at communication to the others will be likely to fail, especially if he is not wholly aware of his own preconceptions and ignores those of his colleagues.

The presentation of empirical findings, the emphatic assertion of facts based on investigations, will carry little significance if the meanings of these facts derive from concepts that have not been described or recognized by the speaker or the hearers. This, I take it, is what we are beginning to realize as we are confronted with the critical evaluation of empirical methods and findings that ignore or neglect the crucial role of the concepts that led to the observations reported as facts.

If we doubt the significance of concepts, we need only recall that we can only know what has been symbolized,

since unlike direct sensory or motor relations to the world and esthetic experience, cognitive knowing requires symbols for knowing, thinking, and conceptualized communication. Moreover facts are the meanings we impute to observations directed by our concepts and assumptions.

Interprofessional communication may seem hopeless or even impossible when approached in this way. But it is hopeless only in so far as we persist naively in ignoring the communication process and these specific obstacles. As soon as we begin to recognize these difficulties and realize that they are created by our own failure to take them into account, we can, I believe, start to communicate and to work together as we must, if we are to cope with the many organized complexities and urgent multidimensional tasks confronting us. A self-conscious awareness on the part of each member of a discipline that he must deliberately strive to communicate with others who do not share his professional training, experience, terminology, and concepts is one step toward better communication.

Another useful approach to better communication is for each professional worker in a team or a conference to give an initial exposition of his concepts and especially his often unformulated assumptions. This does not mean that each must exhaustively describe his professional orientation, but rather give a brief statement that indicates to others how he looks at and perceives the situation, events, or persons about which they are discussing. This is often difficult because, as suggested earlier, many professional workers are not aware of their conceptual frame of reference and do not recognize their assumptions; indeed, many are so naive as to assert that they are not concerned with assumptions but only with facts and generalizations drawn from these facts.

Still another operational procedure is to ask each member of an interprofessional group to state as simply as possible what dimensions of the situation or events, or the problem they face, he sees as essential, if not crucial, to the group's thinking and approach to that problem. Since every situation, event, organism, person, or group of people is multidimensional, each profession can focus attention upon those dimensions which he has learned to recognize and deal with. This is what the British did in wartime operational research.

The advantage of this procedure is that each member of an interprofessional group is given an opportunity to contribute from his discipline or profession to the formulation of a comprehensive approach, a larger and more embracing conception of the problem because his special professional competence enables him to perceive what others may ignore or fail to recognize as significant.

This focusing of the group upon what each can individually contribute has the great advantage of avoiding the frequent expectation that a group of professional workers can and will be able to transform their professional training and experience and arrive at some new interprofessional or interdisciplinary formulation. As experience has shown, this expectation often provokes a defensive resistance to giving up a valid professional stance and convictions so that these interprofessional, interdisciplinary meetings and planning sessions often become an area for polemical apologetics. It is suggested that we cease speaking of interprofessional and interdisciplinary projects and speak of multiprofessional and multidisciplinary approaches so that no one will be troubled by the belief that he must abandon his professional or disciplinary position and move into some vague and unprofessionalized area or field of work.

We have one concrete example of this multiprofessional consideration of a multidimensional question. Thus, a

clinical pathological conference in a teaching hospital is an excellent illustration of how each of the individuals participating in such a conference on the cause of death is able to illuminate the problem by his specialized knowledge and skills.

Indeed, the practice of medicine may be considered as an attempt to develop a multidimensional approach to the living organism-personality, derived from the various medical sciences and focused by the clinical training upon an identified, individual patient. Within recent years medicine has enlarged its concerns to recognize not only what could be viewed in terms of cellular pathology but to take into account the personality and emotions of the patient, his environment and economic-cultural background, social-economical-educational status, and his religious beliefs. Likewise, the public health officer needs a multidimensional approach in planning his program and directing his operations.[4]

Public health exhibits probably the most highly developed multidimensional operations concerned with human living and welfare. The enlargement of the concerns for public health, health care, and prevention of disease is shown by the successive additions to the sections of the APHA and to the staff of schools of public health. Urban planning and public administration urgently need the collaboration of public health workers who also could benefit from such shared experiences.

In all these enterprises it is essential that different professions and disciplines be recruited for team work, since these enterprises face multidimensional situations and tasks requiring the participation of various professions and disciplines not only to grasp the full extent of the problem but to cope effectively with it.

At this point we might invoke the example of the orchestra as offering a prototype for effective multiprofessional operation. In an orchestra, as we well know, there are a number of different instruments and performers, such as the strings, brasses, woodwinds, and percussion. Within each of these groups there are further differentiations, such as first and second violins, violas, cellos, bass violins, harps, and so forth. What gives an orchestra its specific characteristics and its potentialities is that it combines the highest quality of individualized performance on specialized instruments, into a coherent and purposive endeavor. Thus, the orchestra exhibits great specialization and differentiation, with the maximum of organization, probably our nearest approach to an organism with its capacity for functioning as a whole, for purposive goal-seeking behavior.

The special relevance of the orchestra to this discussion is that each player is accorded complete autonomy, but by accepting the common tasks of his fellows, he can and does participate and contribute to the others' performance as they do to his, thereby achieving what no single player can attain alone. Moreover, no player can tell any other player how he should play his instrument, since each player has his own technic, training, and command of his chosen instrument, but each one is ready to accept the chosen music and to follow the leader-conductor for its performance.

In the light of this we could say that the task of focusing the knowledge, skills, and experience of different professions upon the various tasks and problems that now urgently demand attention may be viewed as an occasion for orchestrating these different professional workers. To do this, each must be accorded full autonomy and recognition of his unique, but limited competence for the tasks in hand. Then each must be given opportunity to exhibit his or her competence along with others of different, but equally essential, competence upon the selected theme for their performance.

We may be convinced that for many original creative tasks the individual must be accorded the freedom to explore and discover what he personally can do, especially in science and art. However, to operate a social order and to provide the professional studies, explorations, and operations that are essential for its continuing operation and improvement, we cannot hope to cope with these tasks unless we can learn to communicate across the borders of professional and disciplinary fields, and this calls for a high degree of orchestration.

Unfortunately, we have not recognized the need for these orchestra leaders except in music; hence we are finding it exceedingly difficult to organize and conduct multidimensional projects and to administer multiprofessional groups. No one can write a formula for these, but we could be more aware of the need and be prepared to make some considered efforts to state those needs in terms that would permit operational and general systems research, that is, a multiprofessional approach to the development of methods and procedures for organized complexities, as contrasted with the familiar research project that aims at revealing the relations between variables as a contribution to a single discipline.

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O health, health!
The blessing of the rich!
The riches of the poor!
Who can buy thee
at too dear a rate?

(Ben Jonson: *Volpone, II,* 1605)

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Relations between medical practitioners and health officers have not been consistently good. Conflicts between the two groups have occurred at various times. How and why do such situations develop? Some have explained such events in terms of inadequate communication. The theme of this paper is that poor communication is not the basic problem, but is rather a consequence of other more basic issues. Some of these elements are explored.

SOME SUBSTANTIVE LIMITING CONDITIONS IN COMMUNICATION BETWEEN HEALTH OFFICERS AND MEDICAL PRACTITIONERS

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COMMUNICATION is complex, difficult, and beset with pitfalls. Men talk, write, and gesture to themselves and to each other for many reasons and on innumerable occasions, yet not infrequently the result is confusion rather than clarity, nonsense not sense, misunderstanding rather than comprehension. Moreover, this recognition is neither new nor startling. Indeed, Cratylus, a friend of Plato, became so doubtful of the value of speech that in despair he decided to communicate only by pointing. Others have also noted and studied the same problem without necessarily resorting to such radical and desperate measures. Thomas Hobbes discussed the abuses of speech, pointing out among others that "men register their thoughts wrong, by the inconstancy of the signification of their words; by which they register for their conceptions, that which they never conceived; and so deceive themselves."[1]

Difficulty in communication arises, in short, from the manner in which an individual develops the meanings of a message. This development or interpretation of meaning, however, is generally correlated with and guided by the individual's perception, or more generally by the mode and degree of organization of his perceptual field. Thus, what a man sees and hears and feels in a given communication situation does not happen randomly; it is rather the result of a selection among certain choices of interpretation available to him in a given context. Furthermore, while each individual perceives and communicates out of a private world of his own, this world develops through social influences and processes. Whatever the individual's memories and experiences may be, they derive from the processes by which an individual becomes a member of and acts as a representative of one or more social groups. In these terms perception is essentially social perception, and as such is an aspect of the process of

socialization. Even though communication, in the words of Margaret Schlauch, is "a compromise between the ultimate incommunicability of one person with another and the communication values attached to certain symbols,"[2] the fact is that we do communicate. That we succeed so well most of the time means that in becoming and acting as members of groups, in sharing experiences with others, we acquire a common store of associations, connotations, and other modes of interpretation. Thus, socialization is an essential factor in endeavoring to understand social perception and its relation to effective or ineffective communication.

Socialization is the process by which an individual becomes a member of a given social group, and it is by this process that cultures are transmitted to each new generation. In this sense, socialization has been recognized as a central facet of professional development. Merton has defined this process for medical students as one in which they "are engaged in learning the professional role of the physician by so combining its component knowledge and skills, attitudes and values, as to be motivated and able to perform this role in a professionally and socially acceptable fashion."[3] In other words, through the socialization process the physician is "trained" for the role he is eventually expected to fill in society.

As a result, despite significant individual differences, medical students at the end of four years exhibit a relatively high level of similarity. Eron points out that "All of us who have been concerned with medical education for any length of time have noticed not only the profound changes taking place in students as they progress through four years of medical school, but how alike they all appear to be at the end of those years."[4]

Despite this common basic socialization, however, and the generally strong orientation of health officers to the medical profession, relations between public health officials and medical practitioners have not been consistently good.[5] Conflicts between these two groups have occurred at various times ever since the establishment of modern health departments, and have varied in severity from simple disagreement to violent controversy. How and why do such situations develop? What factors are at work that lead clinical practitioners to accept or oppose the views, recommendations, and actions of public health practitioners? Does the process by which a physician becomes a health officer contain additional different elements than those to which other physicians have been and are exposed? It is likely that a review of a number of such cases will provide clues to answer some of these questions, and enable us to see in what sense inadequate communication can be considered an explanation.

The first case comes from the autobiography of Allen W. Freeman. In 1907, he was offered and accepted the position of medical inspector in the health department of Richmond, Va. Among his duties, he was to visit reported cases of diphtheria in order to be certain that the patients were properly isolated and that everything needful was being done. From Dr. Freeman's point of view, his visit to the first case seemed simple enough. "The family was well to do and the case was in the care of a graduate nurse. By the evidence of the empty syringes which the nurse produced the family physician had given antitoxin enough and in good time. The medical inspector had only to fill out his forms and take his leave. . . . But when he had finished his round of cases and reached the office he was told that Dr. Derby, the physician of the family he had just seen, had called up in hot indignation at his visit. He was not accustomed to having another physician visit one of his cases without first communicating with him. He considered it a serious breach of medical

courtesy that the physician from the health department should have done so in this case." Recognizing that it was important "to go at once to Dr. Derby and explain why it had been necessary to visit his case and to apologize to him for any breach of professional courtesy," Freeman found the doctor in his office and "told his story as well as he could. Dr. Derby listened quietly to the story . . ., expressed himself as fully satisfied and gave his permission for similar visits to any other cases that he might report."[6]

The clue in this incident is provided by the behavior of the medical practitioner in terms of the concept of medical courtesy. Clearly, in his role as a practicing physician he had certain patterned expectations of how other physicians ought to behave toward him, and in turn how he should and would behave toward other practitioners. The code of behavior in terms of which the physician reacted to the medical inspector from the health department is part of the medical culture acquired by physicians in being socialized. It is part of the larger area of medical ethics, that aspect of the culture which is concerned with professional discipline, and which deals with such matters as advertising, fee-splitting, unfair competition, derogation of another physician, and other forms of unprofessional conduct. An important, if not basic function of this concern with the professional behavior of medical men toward the public and toward each other is to regulate access to the medical market, that is to patients. Furthermore, its function is to provide the medical profession with the means through which effective control can be exercised. In this sense, codes of ethics, or more accurately codes of behavior, institutionalize significant values of the medical culture, particularly those concerned with the economics of practice. Clearly, in 1907, the medical code of behavior took no account of the public health physician, who required access to a patient for noneconomic reasons.

Other instances of conflict between public health practitioners and clinical practitioners reveal starkly the economic basis of the situation. For example, Josephine Baker, first director of the Bureau of Child Hygiene in the New York City Department, related that after child health stations had been established and were "doing well in the Brownsville section of Brooklyn, a petition was forwarded to my desk from the mayor's office, signed by 30-odd Brooklyn doctors, protesting bitterly against the Bureau of Child Hygiene because it was ruining medical practice by its results in keeping babies well, and demanding that it be abolished in the interests of the medical profession."[7]

In opposing the development of such activities by public health agencies, physicians in private practice were objecting to what they considered encroachment upon the area of medical practice. Linked with and buttressing the economic aspect are a series of prerogatives and values. These may be a part of the general value system of the society or may be limited to the medical profession. Thus, the compulsory reporting of communicable diseases, such as tuberculosis and the venereal diseases, was considered a violation of personal rights as well as a breach of the confidential nature of the patient-physician relationship.

On January 19, 1897, the New York City Board of Health adopted an ordinance requiring the reporting of cases of pulmonary tuberculosis by physicians. It did not take long for the storm to break.[8] An editorial on January 23 in the "Medical Record," which took a leading part in opposing the action of the health authorities, clearly indicated the reasons for the conflict. "The real obnoxiousness of this amendment to the sanitary code is," according to the writer, "its offensively dictatorial and

defiantly compulsory character. It places the Board in the rather equivocal position of dictating to the profession and of creating a suspicion of an extra bid for public applause by unduly magnifying the importance of its bacteriological department. . . . The profession as a whole has watched with jealous eye the encroachments of the Board upon many of the previously well-recognized privileges of the medical attendant." An editorial published by the same journal in February, 1897, struck directly to the heart of the controversy. After pointing out that "there is no objection to the reports of pulmonary cases for statistical purposes," the editor continues, "it is, however, the extra missionary work assumed by the board which is the ominous and threatening quantity in the equation—the desire to assume official control of the cases after they have been reported, thus not only, by means of alarming bacteriological edicts, directly interfering with the physician in the diagnosis and treatment of the patient, but in the end, by the creation of a public suspicion of his ignorance, possibly depriving him of one of the means of a legitimate livelihood."[8] Other issues were also raised, such as the questionable value of bacteriological diagnosis, that the disease is not highly contagious, and that tuberculosis is so widely prevalent that any attempt at prevention is impractical. When it became evident that the health authorities in New York City would not retreat, the local medical societies made a determined but unsuccessful effort in Albany to deprive the Health Department of the power to deal with tuberculosis. Similarly, in 1912, when the reporting of venereal disease was made compulsory a new storm of opposition broke out. Eventually the opposition faded away.

Incidents of this kind have not been limited to New York City or to the United States. In 1876, when the health authorities of Greenock, Scotland, proposed to institute the compulsory reporting of cases of infectious disease, the medical practitioners of the town rose in a body to oppose such action.[9] Their opposition was based on the arguments that reporting would disturb the confidential relationship between patient and physician, that medical men should not be compelled to become spies, and that if reporting were made compulsory people would hesitate to call in a physician as this would lead to interference with their domestic concerns.

Around the turn of the century, the reporting of communicable disease in Chicago was impeded by a long dispute between the Health Department and the physicians of the city.[10] There were laws requiring the reporting of certain contagious diseases. Many physicians, however, refused to cooperate, insisting that the municipality pay 25 cents for each report. This stand was based on the provision of the state law remunerating physicians for the reporting of births. At one time physicians who did not comply with the law were prosecuted, an action which led the Chicago Medical Society to protest that "the principle at issue is whether our services can be extracted without pay." In reply the city health commissioner characterized this argument as "an excuse unworthy of any physician." The health authorities continued to insist on compulsory reporting without compensation, and even though the controversy dragged on for a few more years, the medical profession eventually accepted their responsibility.

For communication to be effective, those engaged in the process must in some degree share mutually acceptable frames of reference. Value patterns and ideologies serve this function by supplying axiomatic definitions of the situation within which communication takes place. Thus, physicans, whether health officers or private practitioners, generally share ideas concerning the scientific approach to the study of disease, the nature of disease, and, perhaps, ideas and methods

of diagnosis and treatment. However, there are other ideas, areas of knowledge, and values which these two groups share only to a slight degree if at all. The tasks performed by various groups of physicians exhibit great diversity. The most common image of the physician is that he sees patients, and prevents, diagnoses, and treats illness. Actually, a large number of physicians fit this model only to a limited degree or not at all. Among these are radiologists, pathologists, anesthesiologists, and certainly public health administrators. Associated with this diversity are characteristic activities and ideas.

One point of divergence is in the approach to problems of disease. Josephine Baker phrased it well in her comment that the "field of public health was far removed from anything that had been comprised in any conventional medical training. Not that medicine was not an essential background—that was clear enough—but the mass attack instead of individual care began to come to the front. We were dealing with the problems of a community, and the individual became important only when he contributed to the problem as a whole."[11] While Dr. Baker's remarks concern a situation two generations ago, they are not irrelevant. Physicians practicing today were trained a generation or so ago, and even though some changes have occurred in medical education in the interim, the clinical practitioner is still basically oriented to the individual patient. Nor do medical students now being trained indicate much change.

Furthermore, these divergent viewpoints are interlocked with other value clusters. An important cluster of this kind in American society is expressed by the emphasis on practicality. The definition of what is practical, however, will differ for the health officer and the clinical practitioner, and can be expressed in terms of three closely related factors: (1) the immediate goals for action; (2) the criteria used to determine which goals are more significant than others; and (3) the implicit framework of social concepts within which values are perceived and ordered.[12] The public health official may decide that prophylaxis is the most practical approach to the problem of controlling tuberculosis or venereal disease, and develop his program of action to achieve this end. On the other hand, the clinician may decide that such a goal is utopian because the most important task is to deal with the sick person, the person who already has the disease.

Such aims may in turn be affected by still other interests and value clusters. The important place of the economic interest in the relations between public health officials and medical practitioners has already been stressed. Moral issues can also play a significant role. Numerous observers of American culture have commented on its moralistic tendency. This dimension of community behavior may likewise align the practitioners of public health and clinical medicine on opposing sides of a health issue. Two examples illustrate the point, and can help us to tease out certain other elements that may be involved.

Dr. Herman Bundesen became Chicago's health commissioner in 1922 and soon initiated an organized attack on venereal disease. His goal was prevention, to be achieved through education, the distribution of prophylactic means at places where those likely to acquire venereal disease could obtain them (in drug stores, public toilets, and houses of prostitution), and by providing intensive treatment at public clinics.[13] This practical approach met with intense disapproval, not only in the press in general but as well in the medical journals. The "Medical Standard" denounced this "outrageous and unlicensed" use of the health commissioner's authority. For the "Illinois Medical Journal" the whole plan was "revolting." Nowhere, how-

ever, is the character of this moral indignation expressed with greater éclat than in the scrambled logic of this statement which the "Chicago Medical Recorder" quoted approvingly: "God forbid that above the Stars and Stripes any misguided, theoretical radical shall ever place the flag of Priapus and the bar sinister of the Phallic Symbol." Whether Bundesen's program could actually prevent syphilis and gonorrhea seemed of no concern to his medical opponents. It was more important to maintain the traditional moral code and the social mythology in which it was shrouded.

The introduction of such issues in opposing governmental action for the improvement of community health is strikingly illustrated by an incident related by Josephine Baker.[14] At a hearing before a Congressional Committee considering the appropriation of funds for the newly established Children's Bureau, a physician representing a New England medical society told the committee: "We oppose this bill because, if you are going to save the lives of all these women and children at public expense, what inducement will there be for young men to study medicine?" Senator Sheppard, the committee chairman, leaned forward and said: "Perhaps I didn't understand you correctly. You surely don't mean that you want women and children to die unnecessarily or live in constant danger of sickness so there will be something for young doctors to do?" "Why not," replied the physician, "that's the will of God, isn't it?" (One should note, however, that pediatricians as a group favored governmental action to improve the health of children, and specifically supported the Sheppard-Towner Act.)

The two instances just cited direct our attention to several other value elements that tend to produce a negative attitude to action by governmental agencies in dealing with health problems. One is the highly negative valuation of government and the expressed fear of centralized public authority evident in the statements and behavior of many medical practitioners. This is not surprising in view of the strong emphasis in our culture on individualism, and the associated view of health as a private matter. These attitudes derive not only from the earlier American experience, but even more significantly from the set of ideas known as Social Darwinism. In the terms of this philosophy, all life and especially economic activity was a moral struggle in which the strong flourished and the unfit succumbed. Any social measure concerned with welfare or health might interfere with the free play of market forces, and thus perpetuate the more vulnerable members of the community. The logical consequence therefore was to curtail government action as far as feasible. When coupled with a situation in which physicians develop and maintain a practice in a highly competitive context, any act by government which appears in some way to interfere with the access of physicians to the medical market is a hostile act to be condemned and opposed.

This does not mean, of course, that private practitioners will not accept measures intended to protect the public health. Any acceptance, however, tends to be hedged by conditions to safeguard the area of private practice. These attitudes and trends are of long standing. In their studies of Middletown, the Lynds noted these tendencies during the decade 1925-1935. They commented in 1939 that "the attitude of the majority of Middletown's doctors regarding private practice and public health facilities remains substantially that described in 1925. All proposals to develop clinical facilities of whatever type in Middletown still operate within the strait jacket of insistence by the majority of the local medical profession that nothing shall be done to make Middletown healthier that jeopardizes the position of the doctors."[15]

Nor has the situation changed very

much up to the present. Evidence on this point is available in the studies by Rosenstock, Hochbaum, and their coworkers on the impact of Asian influenza on five communities. While the studies do not provide detailed information on the behavior of organized medical groups, there are several items which indicate that medical society officials tended to minimize the need for community measures involving governmental action, and that where they did act a major aim was as far as possible to maintain a business-as-usual situation. For example, in Hazelton, "the official policy of the local medical society was that vaccine should be administered by private physicians in their offices and further that the distribution of vaccine be left to the discretion of individual physicians."[16]

Clearly, the socioeconomic philosophy of most medical practitioners, the social logic within which they perceive values and behavior related to health, is widely at variance with the root ideas of public health. The latter have been so well stated by Gaylord W. Anderson that I can do no better than to quote him. Public health activities derive logically from the fundamental social concept that "society has a responsibility to provide those necessities and protections which individuals cannot provide for themselves. . . . So long as we accept the concept of public responsibility, we must likewise accept the idea that people have both the duty and right to take those measures which will prevent illness or death from whatever cause. To deny this right of the people is to challenge the fundamental concept of democracy—a government by the people for the benefit of the people."[17]

These divergent views derive also from the different origins of public health and clinical medicine. Public health as a field of community action did not develop out of medical practice. The impulse to sanitary reform did not come from the medical profession, even though some physicians played a significant part in calling attention to the community problem of ill health and provided vigorous support in the development of action programs. Broadly speaking, what happened was that the builders of modern public health, accepting certain postulates of economic and social policy, established institutional forms into which accurate and effective medical knowledge could later be fitted. This institutional development did not arise simply from the growth of humanitarian sentiment or of social conscience. It resulted less from a concern for the welfare of the poor than from a growing realization that widespread disease in the community was not and could not be a problem only of the individual, that it was a problem of the entire community. Furthermore, there was an increasing awareness that the cost of disease in the community was a form of social waste that could be eliminated. In short, from the beginning modern public health has taken a broad view of health in the context of community life.

This is not to disparage clinical medicine and the role of the medical practitioner. The central function of the medical profession has been and is to prevent, detect, and cure illness, thus saving lives and alleviating or palliating conditions that are not amenable to other treatment. This function, moreover, is performed primarily through service in a person-to-person relationship. Thus by the very nature of his activity the clinical practitioner tends to take a circumscribed view of the problem of disease. This tendency has been intensified by certain scientific and technical developments in modern medicine, and by the climate of opinion created by atomistic views of society, values such as individualism, and other related factors of which some have already been discussed. As a result, the social context and the community implications of the prac-

titioner's work are much too often overlooked or ignored. Furthermore, the clinical practitioner tends to take for granted and thus to take little or no account of the fact that society provides the conditions which make his activity possible. There are physicians, of course, whose point of view is broader and who recognize the social, economic, and political factors that impinge on and are interlocked with community health institutions. Nevertheless, this group is at present a minority among organized medical practitioners. On the whole, clinical practitioners tend to take a narrow view of health problems in the community, to avoid involvement except where professional interests are potentially or actually concerned, and in general to remain magnificently insulated from the facts of community life. Again, this is a long-term trend. Hermann Biggs arrived at a similar conclusion in 1920. In an address before the New York County Medical Society, he said, "Now the general attitude of the medical profession is part of the kind of work they do; the fact that a physician is generally so absorbed in what he is doing, his own work and the work with his own patients, that he does not look out and get a broad view of the situation as it exists in the State, and his attitude, the natural attitude, is one of obstruction."[15a]

At the same time, the entire medical profession and its field of action are undergoing change. As an example, today, a large part of the profession, about one-third, works wholly or in part for salaries (in hospitals and medical schools, for governmental agencies, pharmaceutical companies, labor unions, and other physicians), and the proportion appears to be increasing. But while the position of the medical practitioner is being altered by changes in science, technology, and social organization, the ideology of individualism and competition still remains the uncompromising official creed. In relation to public health, the situation of the clinical practitioner has been well put by an editorial in the "New England Journal of Medicine." "Organized medicine and the private practitioner," it states, "have questioned the aims and objectives of the public health physician, perhaps justifiably. How far should state-directed public health programs go? Should the tax-supported health programs be designed to encompass also citizens who are able to pay for their own care and treatment? Is continued encroachment by the state on the practice of the private physician in the best interest of the patient? Where does so-called 'public' health leave off, and where does 'private' health begin? Or vice versa? Is it possible for 'public' health to become so dominant that 'private' health, the private practice of medicine, will assume a less than secondary role in American medicine?"[17a]

The divergent viewpoints of public health and clinical medicine continue to exist because they serve to create a consensus in each case for the different groups that maintain them, and because they are what the community as a whole or a particular group within it finds acceptable. However, such acceptability depends on the reassurance and support that the viewpoint and its associated ideas provide. "To a large extent," as Galbraith puts it, ". . . we associate truth with convenience—with what most closely accords with self-interest and individual well-being or promises best to avoid awkward effort or unwelcome dislocation of life. We also find highly acceptable what contributes most to self-esteem. . . . But perhaps most important of all, people approve most of what they best understand . . . economic and social behavior are complex and mentally tiring. Therefore we adhere, as though to a raft, to those ideas which represent our understanding. This is a prime manifestation of vested interest. For a vested interest in understanding is more preciously guarded than any

treasure. It is why men react not infrequently with something akin to religious passion, to the defense of what they have so laboriously learned. Familiarity may breed contempt in some areas of human behavior, but in the field of social ideas, it is the touchstone of acceptability."[18]

Within a given community one would expect diverse groups to show differential readiness to accept or reject ideas and measures in terms of a group's self-image, of its interpretation of its interests, and in the degree to which they are congruent with the logic of the value system which prescribes and motivates the behavior of its members. The basic structure of any value system involves a set of interrelated though not always logically congruent principles. To the degree that such principles are employed to deal with reality and are altered in response to experience, the system may be considered more or less open and rational. However, no system of this kind is ever completely subjected to reality testing; in some measure the logic of the system remains autonomous and is accepted on faith. From this viewpoint, every value system has a "theology,"[19] to use the term in an expanded sense. Where a social group maintains a closed value system or moves to create one, this "theology" is even less subject to reality testing. The further such a process moves in this direction the more serious may be the consequences for the group, for the community of which it is a part, or for both.

Freedman has focused the point sharply in his statement that "Organized medicine has developed an almost obsessed suspicion of community organized health programs, particularly when administered by the government. Because public health agencies are the traditional operators of community organized health programs, public health physicians, who are agents of the government, have received the brunt of the private practitioners suspicions and have been tolerated with reluctance in organized medicine's circles."[5] One consequence of this situation is a considerable loss of contact between medical practitioners and the development and administration of community health programs.

This analysis helps to clarify further the attitudes of physicians in private practice and of public health practitioners. Lack of medical leadership in the development of new programs to meet the health needs of the community has been widely noted by various observers. A statement by Norton S. Brown, president of the New York County Medical Society, in 1959, explaining this situation supports our analysis. "The medical profession," he said, "is rapidly losing the initiative in health matters because we're not using diagnostic objectivity in economic and social problems. We're bemused by slogans and pat phrases that no longer have much to do with reality."[20] More recently Lindsay E. Beaton, president of the Arizona Medical Association, has commented in a similar vein. Endeavoring to explain the negative public image of the medical profession, he pointed to the fact, among others, that physicians have been "going steady" with their own false image of themselves. "We are," he said, "perhaps, more and more alienated from the common run of people by our altered relation to them . . . . We must not, with pious tongue in fat cheek, cry nostalgically for the old days and pretend that we are still nineteenth-century leeches and should be adulated as such."[21] And Dr. Beaton went on to point out the need for explicit programs that would be judged not in terms of the socioeconomic interests of a single group but rather in relation to the public interest. In short, what Drs. Brown and Beaton are advocating is that the medical profession break out of a closed system and begin testing its "theology" against the

reality of current social needs and problems.

On the other hand, the public health practitioner by the very nature of his work must operate with a different value system. While it may in some respects overlap that of the clinical practitioner, its central focus derives from a responsibility to the public in matters affecting the health of the community.[22] Furthermore, a public health practitioner such as a health officer may be exposed to a greater degree of social visibility than the clinical practitioner. The duties of the health officer, such as community leadership, enforcement of laws and regulations, expenditure of public funds, or interpretation of public health activities to legislative bodies and community groups, require that he constantly test his ideas in terms of the reality situation which he faces. (The medical practitioner does this in the clinical situation.) In other words, the very nature of his role requires him to view problems in a community framework.

The divergent value systems and self-images of the public health practitioner and the medical practitioner are buttressed and strengthened by the reference groups from which they derive the norms and standards for their professional behavior. Furthermore, these are also affected by the counter groups to whom they relate in the performance of their functions. Levine and Wellin, in an unpublished study of the role of the health officer, call attention to major functional areas which constitute his position.[23] He is a physician, a health administrator, a public official, and a leader or coordinator of community health affairs. In these capacities, the health officer becomes involved with greater or lesser frequency and intensity with other health officers, other nonmedical workers in public health, city officials and functionaries in other public agencies, members of the medical profession, representatives of voluntary agencies, consumers and the community at large, and extracommunity agencies, for example, a state health department. In the case of the medical practitioner, his position and its functions require him to relate himself to patients, medical colleagues, nurses, laboratory technicians, hospital and health plan administrators, and officials of medical societies. The relations with persons in each of these positions are by no means identical, and involve situations calling for differing attitudes and behavior. A useful tool for the analysis and understanding of these relationships is Merton's concept of the role-set, that is, the "complement of role-relationships in which persons are involved by virtue of occupying a particular social status."[24] This structure of role-relationships may be viewed as a framework for the organization of the perceptual field which practitioners need to perform their functions.

To various elements already discussed one must add yet another, namely, status relations. It is no secret that public health is held in low esteem by medical practitioners. Those who enter this field are suspected of indolence, incompetence, timidity, lack of independence, being less interested in money, and more interested in helping people. This view is of long standing among medical practitioners. As Carey P. McCord describes the situation, a physician in the opinion of many of his professional brethren "may be in only four places—at the bedside, in the consultation room, in the hospital, at the academy of medicine. With a fair degree of tolerance these physicians accept the insurance doctor, the ship's physician, the medical public health officer, the medical teacher and the military surgeon, but rarely are they taken to the profession's bosom. Their enterprises are regarded as rather unfortunate happenings, though not entirely deplorable."[25] To a certain extent this attitude reflects the disdain present in our society for anyone who does not elect to follow the competitive

pattern of the culture. The findings reported in 1959 by Coker, et al., on public health as seen through the eyes of medical students tend to support this point.[26] At the same time these views probably also reflect the fact that public health practice as an area marginal to clinical medicine received a number of physicians of marginal status. Of their existence there can be no doubt. The portrait of Dr. Almus Pickerbaugh, health officer of Nautilus, Iowa, etched in acid by Sinclair Lewis, and the figure of Dr. George Bull, part-time health officer of New Winton, Conn., drawn with ironic compassion by James Gould Cozzens are indicative, and more routine evidence is available. It is impossible to say how representative such types have been of the health officer group as a whole. Nonetheless, such examples were sufficient to reinforce the low opinion in which public health was held. Furthermore, the recruitment and training of health officers on a professional basis is only a matter of the past 40 years or so. In 1921, there were 1,000 full-time medical health officers, of whom 225 were in the Public Health Service. The majority of health officers were appointed on a part-time basis and selected from the ranks of practicing physicians. Frequently these were political appointments. In 1921, Ferrell emphasized that "Capable men will not enter the public health field unless there is a reasonable prospect that their work will be recognized as professional rather than political, and unless they can have reasonable security of tenure."[27] Even though significant changes have occurred over the past 30 years in the recruitment and training of public health practitioners, the old stereotypes still persist and undoubtedly affect the relations of public health physicians and private practitioners today. To be sure, since 1949 public health has become a recognized specialty of medicine, and this may perhaps raise the status of the health officer. Yet one cannot overlook the fact that many of the areas of knowledge and the technics required by the public health practitioner today are nonmedical. In this sense, public health practice, even though a recognized medical specialty is probably becoming more and more marginal to clinical practice.

It should be clear at this point that difficulties in communication between public health practitioners and medical practitioners cannot be explained simply by calling attention to differences in perception and orientation. Beneath this surface lie conflicts based on real issues that cannot so easily be resolved. Hopes and wishes alone are insufficient to deal with real issues. The study of five communities by Rosenstock, Hochbaum, and Leventhal revealed that in all of them "the medical society appeared to be the one key group that could determine whether or not action of any kind would be taken and also the kind of action that would be taken." Indeed, the investigators were surprised at "the relative completeness of the authority of the medical society."[28] One may ask: What about the health officer and the local health department in these communities? Did they exist? Did the public health agency abdicate its role? Who is charged with responsibility for community health? The health department or the medical society? Clearly these are questions of political power, questions concerning the ability to make decisions and the authority to enforce them. From this viewpoint, communication is not the fundamental problem. Mutual appreciation between public health practitioners and medical practitioners may facilitate communication between the two groups, but only as long as the interests of private practitioners or of public health practitioners do not seem to be affected. One might also point out that the public health physician has often settled for limited goals in his relations with private prac-

titioners, basing his adaptation on the premise that the boundaries of private practice must and will be little affected by his activities. To the extent to which he clearly separates his province of action (environmental health, vital statistics, etc.), he may be isolating his domain from that of the medical practitioner and minimizing the possibilities for conflict. Is there then, in this sense, a tacit decision on both sides not to communicate about certain matters? The problems raised here and previously in this paper all deserve investigation. Communication is affected by perception, and perception in turn by interests, values, status, and power relations. The issues in which these factors are involved will not be solved by goodwill or by better communication skills. Much more is needed. We need studies of the power relationships that exist in the community between the health officer, the organized medical profession, the political groups and others that affect his actions. What constraints (financial, political, social, personal) lead the health officer to act as he does? Only as such institutional questions are elucidated can we deal with the problem of communication in a truly meaningful way.

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Understanding of words used in common by different disciplines, points of view, levels of knowledge—these and other factors influence the problem of communication in multidisciplinary programs. Illustrations of this problem are offered here and possibilities for handling it are suggested.

PROBLEMS OF COMMUNICATION AND COORDINATION WITHIN HEALTH PROGRAMS

Myron E. Wegman, M.D., F.A.P.H.A.

EXISTENCE of 14 different sections in the American Public Health Association in itself illustrates the complicated nature of the problems of communication within the public health team and the varied sorts of persons who may be involved in the process of communication. Related questions deal with relative importance of different workers in the hierarchy, the respect in which they are held by each other, the ease with which ideas can be passed back and forth and accepted, and the facility with which language and terminology commonly used by one group is understood by another. To review the problems more concretely, certain specific situations are cited as illustrative. These include malaria, particularly the world-wide malaria eradication campaign, the problem of school health, the problem of the care of the premature infant, and the problem of the interchange among the various members of an international advisory team.

In dealing with malaria at the present time we have a technic developed through the collaborative efforts of entomologists, chemists, physicians, and engineers by which it is possible to eradicate the disease without necessarily eradicating the vector. The basis of this approach is that malaria is a self-limited disease and if the patient is not reinfected over a period of three years he will be unable to transmit the disease to anyone else. Since the anopheline mosquitoes are largely domiciliary species, the essential measure is to spray the walls of the household thoroughly and completely with a residual insecticide. During the interval after the mosquito has fed on a person it always lights on the wall to rest thus coming in contact with a lethal insecticide. It is not possible here to go into the complications of how things might be handled in areas where all the mosquitoes may be resistant to the insecticide or where because of the nomadic habits of the people it is impossible to find collections of houses to spray. Under such circumstances, devices for the continuous therapy of persons, using materials such as medicated salt, are being studied. It is obvious, however, that just the problem of spraying is far more complicated than appears at first examination. When the malaria eradication program was first planned, it seemed simply a problem of engineering from the standpoint of measuring and calculating how many houses and homes were to be sprayed, and of the logistics of getting insecticide and sprayers to the houses. Nevertheless, a number of complications ap-

peared once the campaign really got started. For one thing, because the nature of the activity involved large amounts of human effort in terms of methodical spraying, the problem of getting the spraymen to the areas regularly became a matter of some moment. One of the necessary steps was the development of a seminar for motor vehicle repair and the employment of a regular consultant in this field. Certainly, physicians and engineers were not accustomed to working with such a person yet he became a key man in the enterprise.

What was perhaps even more revealing was the relationship to the problem of health education. When the campaign first started some of the general public health people had suggested that health education might play a significant role in facilitating the spraying. This was, however, rejected by those who saw the problem as merely one of systematic execution of a mechanical task, that is spraying. They very promptly found, however, that in some villages it was the custom always to wash the walls twice a year and in other places to paint them at regular intervals. The householder saw no reason why the spraying should interfere with these operations, not realizing that this would effectively neutralize any of the residual insecticide. The result of this experience is even more interesting. The experts in malaria eradication swung from a position where they did not concede any importance to health education to the other extreme of a trusting faith that health education had some magic technics which could solve the problem very quickly. Unfortunately, this has not been true, although with the characteristic interplay of forces much progress has been made since the two groups began to communicate with each other.

The contrasts in the field of school health are less striking, but physicians often have a blind faith that when the teachers teach, learning follows. Teachers, on the other hand, often have an equally blind faith that the physician in his omniscience can produce the right recommendation for any kind of medical or health problem. Perhaps the greatest difficulty with both is that each has at one stage learned to listen to the voice of authority and is often unable to deny this voice or to be receptive to new ideas.

Still another experience may be useful in illustrating the difficulties of communication. At the Charity Hospital in New Orleans there is an extremely large service for premature infants which, despite the decision to admit infants only of 2,200 grams (that is 5 lbs or under, rather than the traditional 5½ lbs), has had a census as high as 155 babies. Obviously, the problem of nursing care became acute and it soon became evident that the service could never be staffed only with graduate nurses. In the effort to study the situation and in order to arrive at reasonable standards for numbers of nurses and nursing aides, and related matters, a group of sociologists was asked to study the situation. Some of their results were exceedingly interesting but none more so than the sharp distinction between what was supposed to be the role of the nursing aide and the part that she actually played. For example, the nursing aide was under strict orders never to use her own judgment or to make a decision regarding the feeding or nourishment of the baby. On the other hand, the physician she was supposed to consult was often a green intern or a very slightly ripened assistant resident who knew, although he could not admit it openly, that the nursing aide was far more experienced in this field than he. The nursing aide had to tell the physician what she thought he should do, while allowing him to maintain his pride that he was really making the decision. Such a situation obviously has its very real dangers. There were good reasons for not trusting a nursing aide to make decisions in the light of her limited background and limited understanding of the physiologic

processes involved. In 90 per cent of the cases, however, a recommendation based purely on empirical experience was obviously more satisfactory than one based solely on book learning. Often, fortunately, relationships and communication were good enough to achieve the kind of open interchange necessary while still maintaining the status of the two widely separated protagonists. This required good sense and forbearance on the part of the physician and an understanding by the nursing aide of the limitations of her own knowledge.

The illustrations which I have offered are problems for which I have no ready solution to offer, but it seems to me that some of the factors at play can be more easily dealt with if they are understood. Possibly one of the greatest difficulties in communication among persons from different disciplines and different backgrounds is sheer lack of understanding of words. In WHO and PAHO we always said that we had a tremendous advantage in the field of international relations because medicine and public health gave us a common language and a common goal which the politician did not have. Nevertheless, within our field there are very substantial word problems. How many physicians, for example, really know the meaning of the concept "nursing arts"? How many engineers understand the meaning of "pathogenesis"? How many physicians understand the meaning of "stress" as used by an engineer? The question of mere understanding of words which the trained person unconsciously assumes is known to the other professional person can be a distinct block.

Beyond this there is always the question of prestige level or social level, which varies in degree from one country to another, but the difference in status between physician and nurse is known to all, even though it may be decried as exaggerated. Similar differences exist between the nurse and the nursing auxiliary. We start out on the premise that in any organized program a certain number of orders must be given by the leaders, but that, in contrast to a military situation, public health programs are not likely to succeed if every member of the team is not aware of the rationale behind the order and willing to accept it as well reasoned rather than something to be followed blindly.

If we start out from the premise that we all have similar goals, it seems to me that the main causes for difficulties in communication might be summarized as due to a lack of common understanding of words and technical concepts, existing differences in prestige, a rather natural inclination for some to wish to assert their power of position by giving orders which should be followed without question, or the inclination of others to maintain a sort of truculent independence to justify their own position even though they recognize they must be followers.

Whatever method may be used to break down these problems of mutual understanding must be based on mutual respect for each other's abilities and limitations. Formal staff meetings are not likely to help much but development of an atmosphere of cordiality and friendship within the unit can accomplish a good deal.

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The application of social science in public health involves the employment of social scientists by various health agencies. In this paper the author discusses the factors that must be considered if there is to be fruitful collaboration between the two professional groups. Interdisciplinary communication is one aspect of this larger situation and is discussed in this connection.

CULTURAL ANTHROPOLOGY, SOCIAL PSYCHOLOGY, AND SOCIOLOGY IN PUBLIC HEALTH

I. M. Rosenstock, Ph.D., F.A.P.H.A.

PUBLIC health interest in the social or behavioral sciences has increased rapidly within the last decade. To an ever increasing extent, public health administrators are finding it helpful to draw upon the substantive findings and the research competence of behavioral science. Yet it has never seemed quite clear to public health people that behavioral science is not a single discipline but rather a generic term for a number of separate disciplines which have something in common but which are in significant ways different from each other. Should the public health worker draw upon the services of the cultural anthropologist or will a social psychologist provide greater assistance? How does sociology fit into the picture? These are important questions since the results of the activities of the three groups may sometimes be quite different.

This paper deals with two major issues: first, how a public health worker in need of behavioral science assistance can decide whether cultural anthropology, social psychology, or sociology would make the most useful contribution to his program; and second, the nature of communication problems existing between the behavioral sciences and the health professions.

How to Select a Particular Behavioral Science Discipline

It will be helpful to review, if only briefly, the kinds of decisions the administrator will have made before asking which of the three behavioral sciences will be most helpful. He will probably have come to realize that the success of any public health control program depends upon the degree of acceptance of that program by one or more individuals or groups in a community, and he will also have realized the importance of obtaining the best data available on factors associated with public acceptance or rejection of various programs, services, and patterns of operation. He will have decided that the behavioral sciences, concerned as they are with behavior and explanations of why people behave as they do, will either have answers to his questions or will have methods for obtaining such answers. But now he is confronted with a knotty question: Which of the three behavioral disciplines should he draw on?

First Criterion: Objectives of the Several Behavioral Sciences

Let us first consider the objectives of the three disciplines. The statements that I make are intended to apply to the central objectives of the disciplines and not necessarily to the objectives of every representative of those disciplines. For example, I will indicate what I believe cultural anthropology is about but not necessarily what all cultural anthropologists do. There has probably always been sufficient overlap among the three disciplines so that transition from one to the other is not difficult. Indeed, in the last dozen years or so, many behavioral scientists have attempted to bridge gaps between the fields and in some cases have in effect switched fields. One may cite as an example the work of psychologists and sociologists on the forces existing within small face-to-face groups. On reviewing these studies, one would be hard put to distinguish those done by psychologists from those done by sociologists.

I also wish to make it clear that my remarks on anthropology will be confined to cultural anthropology. In addition, my remarks on psychology will be focused entirely on social psychology. I specifically exclude clinical psychology from my discussion since I think the clinician's role in mental health is reasonably well understood and accepted.

The central problem in cultural anthropology is the analysis of entire cultures and comparisons among cultures. Cultural anthropology asks the question: What is the configuration of learned behavior and the results of behavior that are common to a whole culture and are transmitted by institutions and shared by the members? Because of this orientation, cultural anthropologists are concerned with such variables as socialization, kinship structure, and social organization.

Sociology is more concerned with collective phenomena existing within parts of a culture. It asks the question: How do specific groups and institutions within a culture develop values and objectives that are unique and how does each operate to produce similarities and uniformities in the behavior of its respective members? On the basis of this focus, sociologists are concerned with such variables as social class, role, and status.

Social psychology is primarily concerned with individual phenomena within the group setting. It asks the question: How do individual factors interact with group factors to determine what each member of a group will do? Social psychologists, thus, are concerned with such variables as motivation, attitude, and personality.

None of the three behavioral sciences denies the variables, findings, or objectives of the others. Quite the contrary, each tends to accept and profit from the others. On occasion, each will use the variables of the others. But the main area of concern and study of the three tends to be as indicated—anthropology is concerned with the constraints of total culture, sociology with the consequences of group membership, and social psychology with the consequences of social and unique personal forces.

Now sociology and social psychology take cultural norms as given. For this reason, effective sociological and social psychological research require considerable knowledge about the main cultural emphases existing among a particular group of people. A sociologist or social psychologist would find himself in a most uncomfortable position if, restricted to his own methods, he had to identify salient factors determining health behavior in a tribe of people about whom he knew little or nothing at all. The methods of cultural anthropology, on the other hand, were developed out of just such a situation and are quite appropriate to identify the salient characteristics of a population which generates

fruitful hypotheses to account for behavior.

Generally, sociologists and psychologists are only able to make useful studies without specific reference to any cultural facts when they confine themselves to individuals and groups within their own culture, because they themselves are limited by their culture and think in ways dictated by their culture. In attempting to explain the behavior of middle class Americans, the American psychologist would tend to give far less emphasis to supernatural beliefs than he would to natural beliefs. In some cultures, the exclusion of such supernatural beliefs would of course be quite inappropriate.

Second Criterion: Purpose of Explanation of Behavior in Public Health

In the logic of science, an explanation may be deemed adequate if, other things being equal, it fully accounts for some observed event, whatever the level of discourse used to account for the event. And all three behavioral sciences tend to account for the events they observe. However, an explanation may be scientifically adequate, but not useful from the practical program point of view in public health.

Now, as a psychologist it is my view that the central variables used in the three disciplines differ considerably in terms of their susceptibility to change by outside intervention. The variables used in cultural studies and sociological studies are for the most part not easily changed by health workers. On the other hand, some of the variables of social psychology are amenable to change. To the extent that the health worker is prepared to adapt his program to fit the personal characteristics of his clients, any of the three disciplines may provide him with useful information. To the extent that he way wish to change some of the personal characteristics of his clients through education, psychological variables will frequently be more useful.

This can be exemplified by reference to recent experience in polio immunization programs. Sociological studies have demonstrated that there is a high correlation between social class and participation in vaccination programs. Health workers cannot change the social class of their clients although they can adapt and direct their appeals to the appropriate groups. Now, psychological studies throw light on why social class is related to participation by identifying certain motives and beliefs that are associated with social class. With such knowledge, one can in theory at least, design a program to teach new beliefs and motives.

It would appear, then, that in terms of objectives and over-all approach, cultural anthropology can play a key role where little is known about the customs, traditions, life values of a particular population or subpopulation in a society. By identifying these cultural facts, anthropology gives meaning to uniqueness that is subsequently identified by other disciplines. It would appear that sociology is particularly helpful in identifying and describing the manner in which groups influence their members to accept or reject beliefs necessary for sound health behavior. Finally, social psychology is particularly useful in identifying the nature of the motives or beliefs that in interaction with social forces determine the individual's response.

The situation is, of course, more complicated because of the fact noted earlier that when we leave considerations of anthropology, sociology, and psychology and rather talk about the anthropologist, sociologist, and psychologist, we find that professionals in one discipline frequently use the variables, methods, and approaches of the other two. Moreover, when we think of the professional worker

rather than his discipline, the situation is further complicated by the fact that intelligence, imagination, and creativity play a most important role in qualifying the behavioral scientist. Thus, even a purely psychological problem might be better studied by an intelligent anthropologist or sociologist than by an unintelligent psychologist.

Third Criterion: Methods Employed by Behavioral Sciences

The foregoing discussion is related principally to the objectives of the three behavioral science disciplines and to the types of data they tend to produce. A word should be said as well about the methods employed by the disciplines.

Cultural anthropology tends to employ methods which produce qualitative rather than quantitative results. Validation of results in that field depends upon internal consistency and repetition of observations. This is quite appropriate for a discipline that is concerned with developing hypotheses rather than testing them. The anthropologist may also play an important role in making keen observations in a social setting about which not enough is known. On the other hand, sociology and social psychology employ relatively precise, quantitative approaches which produce results whose statistical significance can often be evaluated. In these fields, interest is not limited to developing hypotheses but also emphasizes testing hypotheses.

A second useful methodological distinction concerns the use of research controls. In research, anthropology never attempts to control the phenomena it studies, sociology relies on statistical controls, and psychology emphasizes both statistical and experimental controls.

Finally, a third distinction among the three behavioral sciences concerns skill in experimental design. Here psychology is likely to provide better training than either sociology or anthropology since experiments and experimental manipulations are an important part of the training of the psychologist.

I think it is now possible to give the public health worker an answer to the initial question. When he has the opportunity to choose between an anthropologist, sociologist, or psychologist, his decision should be based on the kinds of information he needs, on the amount of knowledge already available about the population toward which his program is directed, on the kinds of action programs that are going to be possible as a result of any data that may be obtained, and on what knowledge he can obtain about the intelligence and the comprehensiveness of training of the particular candidate he is considering. In addition, he should decide whether he wants his behavioral scientist not only to produce behavioral data but to consult on experimental design.

It should be repeated that the boundaries between the three disciplines are sometimes vague and difficult to define. Many members of the several disciplines may disagree with my definitions; however, it has not been my purpose to define the "true" nature of these disciplines now and forever but rather to help the practitioner find his way in an area about which some confusion exists.

Finally, the practitioner should be cautioned that the decisions he must make in program planning and operation will usually be based upon so many complex considerations that no one research discipline can provide all the answers needed. Behavioral science research will not solve budgetary problems. Economic research will not solve public relations problems. None of these alone will be adequate for deciding on program priority. The practitioner must approach disciplinary research with reasonable expectation of the kinds of information it will produce and he must not expect more of it than it can produce.

Communication Between Behavioral Science and Public Health

Let us presume now that the administrator has selected a behavioral scientist to work with his program. What are the potential problems that may occur to reduce the effectiveness of the relationship? What steps can he take to maximize the likelihood of productive work?

Orientation of the Behavioral Scientist to His Job

If a responsible professional employee is to work effectively, he must see the relevance of his proposed activities to the methods and objectives of the organizational unit for which they are being done. It also helps to see how the methods and objectives of his organizational unit mesh with those of the next lower and higher units and so on. This requirement might be subsumed under the need for effective orientation.

The public health worker may employ a behavioral scientist to solve a specific problem or he may employ a behavioral scientist when he does not know what his specific problem is. In either case, it is essential to show the new employee how the objectives of his work fit within the context of the unit or agency goals. If effective orientation is not accomplished, as has so often been true in the past, the administrator and his new employee are in for rough sailing for a period of time —perhaps never to return to calm seas. If the behavioral scientist is given considerable freedom to develop his own work but is not encouraged to learn his organization effectively, the freedom is not freedom but anarchy, and the work finally performed—however interesting it may be theoretically—will likely have little use in public health. On the other hand, if the health worker failing to provide orientation insists, nevertheless, that one or another specific service be performed, serious morale problems are almost certain to result with a concomitant loss of productivity.

My own belief about the way to make best use of a behavioral scientist in public health after providing him with good orientation to the history, traditions, objectives, and methods of the agency is to give him a measure of independence in developing his own specific objectives. The newly qualified behavioral scientist should probably be given a reasonably specific problem to attack with some independence in setting hypotheses and methods of study. With increasing experience—and assuming effective orientation—the behavioral scientist may safely be given increasing independence ultimately including responsibility for the development of an entire program of work.

It may be argued that the necessity to show the employee the relationship between his work and the methods and goals of each level of the organization exists for all categories and is not restricted to behavioral scientists. Of course, this is true; but the problem exists more in connection with behavioral science than in other disciplines because of a unique combination of circumstances. In the first place, the behavioral scientist is likely to enter the organization as a full professional but with little or no knowledge of public health. Notwithstanding his ignorance of public health, he is frequently expected to perform on the level of a full professional worker in this field. He has had neither formal training nor apprenticeship in health work, and is consequently not able to design his own methods in the context of the agency's objectives for a considerable period of time after employment. This alone makes him unique, but there is more. The public health worker employing him, especially if this is the first experience of the agency with behavioral scientists, may have difficulty in understanding him or in being understood.

Moreover, the chances are reasonably good that the decision to employ a behavioral scientist in the first place represents a departure from a traditional approach and suggests at least some ambiguities and confusion within the hierarchy of the agency as to precisely where it is going and how. All these factors can interact to put a great strain on the relationship between the health worker and the behavioral scientist he employs, if the opportunity for clarity and effective orientation is not provided.

Thought and Language Barriers

Cultural anthropology, social psychology, and sociology may be characterized as sciences in the sense that whatever their theoretical approaches may be they all attempt in a systematic manner to establish relationships among variables. The three, then, are primarily concerned with establishing what is true and distinguishing it from what is not true regardless of whether it serves a practical purpose. Practitioners, unlike scientists, focus on the accomplishment of some practical end. They are concerned with truth and reality only in so far as it can be employed to accomplish their socially useful purpose. It is perfectly possible, of course, for a given individual to be on occasion a scientist, and on other occasions a practitioner. But in my opinion, limitations of human intelligence generally permit a given person to focus effectively on only one of these values at a time. Thus, when the public health practitioner calls upon the behavioral scientist, a situation exists in which poor communication may result. The practitioner obviously wants something practical. He wants it inexpensively. Frequently he will need it soon if not, indeed, yesterday. As a practitioner, he may not have the patience or the desire to learn the details of theoretical orientation or of methodology that are frequently so interesting to the scientist. The behavioral scientist on the other hand, as a scientist, may not be able to approach the solution of a practical problem without a considerable amount of thought, a review of scientific literature, and in many cases the obtaining of new data, often involving considerable expense. He may not feel that he is capable of producing quick answers to complex questions. For personal reasons, he may be more interested in the theoretical issues involved in the program question than in the practical aspects of the problem, especially if his orientation to agency objectives and methods has been poor. In this setting, the danger of communication problems is great. The practitioner may accuse the behavioral scientist of being impractical, of taking too long, of spending too much money, of not being concerned with the objectives of public health. The behavioral scientist may accuse the practitioner of being anti-intellectual, antiscientific, oriented administratively rather than program oriented, and so on.

It seems to me that behavioral scientists can learn—indeed, have in many settings already learned—that a health need existing in a population will not sit still pending the completion of a complex long-term study. They can learn that the program administrator is charged with the responsibility for solving a real problem rather than obtaining interesting findings. The public health practitioner, on the other hand, can learn and has learned in many cases that there is nothing so practical as a good theory, that some delay in solving a practical problem today in order to study it adequately may pay off in multiplied dividends tomorrow.

One of the most frequent causes of failures in communication is the failure to try. It is simpler not to talk to a stranger than to try to understand him. I can point to many reputable health workers who claim that they do not understand the "gobbledygook" of behavioral science, but who consistently

avoid all opportunities to talk with behavioral scientists, thereby avoiding the one action that might lead to clarification. Of equal concern, some behavioral scientists have been most reluctant to talk with their public health counterparts. Obviously, effective communication requires the participation of at least "two" persons.

And now we come to the most obvious problem confronting members of different disciplines in attempting to communicate and work with each other and that is the problem of the language they use. I am not aware of any studies made on this problem that have relevance in today's discussion, but as a behavioral scientist with almost ten years in health, I have had certain experiences that may be instructive. I should like to point out first that it is not the esoteric words or the peculiar words of a discipline that create most of the difficulty. For the very reason that they are esoteric or peculiar, they will cause confusion and will compel definition. Terms like anomie, Oedipus complex, latent learning, mechanisms of defense, reference group, and the like, while not generally understood by persons outside the disciplines from which they derive, are in the long run not bad terms since their very strangeness frequently requires that they be defined. Rather, it is the words that are common to most disciplines but which have distinct meanings in the several disciplines that more frequently provide a basis for confusion.

Let me describe briefly some of the characteristics of scientific thinking and definition which provide a setting in which the language of the social scientist may better be understood. Because rigorousness, precision, and objectivity are basic to science, the tools and language of science must also be rigorous, precise, and objective. When the scientist operates in his scientific role, he places no moral valuations on the things he studies. Science is confined to description of the relationships among variables. Now it is perfectly true that a scientist is not a scientist 24 hours a day. He may be as fervent a supporter of this cause or that cause as any practitioner. But as a scientist he is oriented toward operating in an objective manner. In interpreting the meaning of a term used by a behavioral scientist, it is thus necessary to know whether or not he is speaking as a scientist. This is, after all, not so different from the need to understand the context in which anything is said. Surely our conversations at social engagements, in car pools, and in the office are not identical and it would be unfair to a speaker to attempt to interpret the meaning of statements made by him without knowing from which of the three settings they emerged.

As indicated, the scientist attempts to give precise and complete definitions to terms he uses. We frequently see examples of this in the titles of tables which leave no doubt as to what is being reported. We all know, of course, that completeness and precision may sometimes backfire as in the case of the overzealous statistician who titled one table "Health workers broken down by age and sex."

Now for some examples. The word "behavior" has certain fairly clear meanings in general discourse and in the behavioral sciences. I frequently used the term in communications to public health workers and I had imagined that the communications were adequate. Imagine my surprise, then, when a public health administrator with whom I had become friendly confessed to me that my use of the word behavior had always irritated him since for him the word had always had an evaluative connotation, as in the expression "behave yourself" or "being on your good behavior." He had apparently developed the feeling that when I used the word, I was setting myself up as a judge of people. As a scientist, of course, when

I spoke of behavior or people's responses, no attempt was made to imply that these actions were good or bad, ethical or unethical, honest or dishonest, but rather that they were what they were.

The term "attitude" would appear to carry some of the same danger. The behavioral scientist tends to use it to describe an internal tendency that predisposes an individual to behave or think in a certain way. The public health worker is not unlikely to think of attitude as encompassing biases or prejudices.

The term "hypothesis" has also provided the basis for misunderstanding between social scientists and public health practitioners for reasons which will not be hard to understand in the light of the foregoing discussion. In presenting an hypothesis, the behavioral scientist is stating a proposition usually relating one fact to another fact. The statement of the hypothesis in a research context merely indicates that the scientist intends to test whether the stated relationship is true or not true. Yet, I have heard practitioners accuse behavioral scientists of treating a hypothesis as an assumption that will not be tested. I have also heard the accusation that a hypothesis reflects what the behavioral scientist believes is true and that he will go to almost any lengths to support his hypothesis. Although as a human being the social scientist may and will prefer one hypothesis to another, he should as a scientist obtain data which are equally capable of arguing against the hypothesis as they are of arguing in favor of the hypothesis.

There is little need to add examples since my point should be clear—because of the different contexts in which the practitioner and the behavioral scientist work, think, talk, and hear, there may be a tendency for each to misunderstand the language and even the motives of the other. This tendency is perhaps more pronounced when considering words and concepts that have clear although somewhat different meanings in the two fields. A certain amount of conflict between the orientations of the scientist and the practitioner is perhaps inevitable. But with reasonable understanding on both sides of the respective values of the two orientations, this conflict may be minimized. There is no single element that will do more to insure adequate communication than the deep desire to understand and to be understood.

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Modern public health is concerned not only with past problems and programs which must still be handled, but even more with new challenges, the public health of tomorrow. In this presentation, the reader will find an analytic and systematic approach to this question, based upon the experience in program planning and evaluation of the New York City Health Department.

PROGRAM PLANNING AND EVALUATION IN A MODERN CITY HEALTH DEPARTMENT

George James, M.D., F.A.P.H.A.

IT HAS become customary to excuse the absence of proof of effectiveness and lack of reliability in the practice of a profession by calling it an "art." Today, public health practice places great emphasis upon its art, because it has so little science to apply. But how does one transform an art into a science?

When criticism is leveled at the inexactness of public health practice, it is important to note that this refers to the present situation and not to our impressive victories against the diseases of the past. The tested and proved weapons worked well against typhoid, diphtheria, and smallpox. As practitioners we did control these scourges effectively. But the Maginot Line which could have stopped the Kaiser hardly slowed the Wehrmacht, the expert opinion of the French general staff notwithstanding.

If recognition of our weaknesses is a first step, then a search for corrective measures must follow. In this search it is not surprising that we turn again to the cornerstones of public health practice —epidemiology and statistics. In this paper I shall show how the New York City Department of Health utilizes them in program planning and evaluation.

The organization of the New York City Department of Health for research, program planning, and evaluation has been reviewed before.[1] Its major elements are an interdisciplinary team headed by a deputy commissioner, whose full time is spent in these activities, and a widely representative research committee. In 1960, the Bureau of Records and Statistics had been placed organizationally within this Office of Program Planning, Research and Evaluation, which also includes physicians, nurses, social workers, sanitarians, health educators, and social scientists. Since this office works best as an integral part of each operating program, it is useful to have its personnel dispersed for administrative supervision to the program bureaus while receiving technical supervision from the staff office. In addition, its practice of including among its staff high-level representatives of the professional disciplines in public health has paid dividends when these individuals exerted effective pressures for research and development upon their colleagues.

The Office of Program Planning, Research and Evaluation can work in many different ways, while maintaining the

maximum flexibility required by the specific problem. Some of its projects are carried out in partnership with program directors or medical schools, some are farmed out entirely, and others are done wholly by the office staff itself. The emphasis is on high quality, but it must also be on sheer quantity. A department such as ours cannot readily exclude significant problems pressing upon it, no more than it can content itself with inadequate efforts once a definite start is made. These combined pressures force the staff to develop a large number of cooperative projects, a policy which multiplies its total effectiveness manyfold. This in turn leads to frequent changes in priorities, intensive exploration of new ideas, and extensive sifting of potential resources. These pressures also force the staff members to become more problem-centered than agency-centered, since their mission is continuously being defined by current needs instead of traditional solutions. Our department knows that the familiar and sometimes still useful solutions can be adequately supplied by the program bureaus. The impact of new problems also drives the office to turn over to program bureaus the routine responsibility for any project which has become stabilized. This keeps its potential from becoming dispersed among a number of vested program interests. In the New York City Department of Health we try very hard not to "reward research talent by extinguishing it."

A rough scheme to assist the health officer to take an over-all view of program planning for modern public health is presented in Table 1. A more complete explanation of this table appears elsewhere.[2,3] The central concept in the table is a chronological classification of health programs. It divides present health activity and responsibility into programs which can be characterized by assigning their major historic significance to the past, present, or future. Our attention in this discussion will be directed exclusively to some of the activities listed beside the title "Present priorities." Due to limitations of space, only a few illustrative efforts can be presented.

Public Health Programs of the Past

A major priority for public health programs of the past is streamlining. This term, characteristic of our age of speed, denotes improvement in program efficiency. To the extent that we can discard unproductive activity, to that extent we recapture resources with which to attack new problems. The health officer can perform this streamlining readily when the need is obvious, the opportunity available, and the change generally acceptable. When these conditions are not present, then he can undertake a "demonstration-in-reverse," proving that existing preventive barriers can be retained despite the omission of a traditional task.

As Vandow[4] explains, Credé's silver nitrate procedure was shown to be effective in the prevention of ophthalmia neonatorum in 1881, and was made compulsory in New York City in 1922. Additional studies revealed the hazards of the method as well as a disturbing number of failures. The rapid fall in gonorrheal ophthalmia and the availability of potent antibiotics have made this condition a disease of the past. Recently, the New York City Board of Health relaxed the requirement for silver nitrate prophylaxis, permitting the use of other local agents or parenteral antibiotics. Of particular pertinence to this discussion is a special clause in the revised code allowing hospitals to omit all prophylaxis under controlled conditions. Although all mandatory provisions relating to prophylaxis were repealed two years later, the period of encouragement for experimentation made available data which Vandow used to evaluate the several

Table 1—Major Principles of Program Planning for a Local Health Department

Program Planning Areas	Public Health Programs of the Past	Public Health Programs of the Present	Public Health Programs of the Future
Needs	Known in practical terms	Known in practical terms	Known in general terms only
Resources	Available in adequate supply	Available, but supply not yet fully adequate	Not available even in an absolute sense, except for a few with unproved potential
Community attitudes	Satisfactory	Generally satisfactory, but not sufficiently so	Unknown in terms of the effective efforts required to control the problem, which are not yet available
Health services	Adequately developed	Developed to a significant degree, but not completely so	Ineffective except in pilot projects
Present priorities	1. Maintain barriers 2. Streamline by evaluating and weeding out relatively unproductive effort 3. Judicious use of "negative" health education	1. Increase health services 2. Build evaluation into the program 3. Research to improve resources still further 4. Streamline as in programs of the past 5. Health education to improve attitudes further	1. Research to develop resources and hence translate needs into practical objectives 2. Demonstration of potential resources: (a) to show their impact on a specific health problem (b) to show their impact on other health department programs and activities (c) to gain public acceptance (d) to serve as a framework for further research (e) to serve as a means of gradually developing future programs of the department

streamlined programs which had been in use.

The results indicated that "specific prophylaxis" gave lower attack rates of gonorrheal ophthalmia than did "no prophylaxis," but the total number of cases was small. The study includes much diligent work by the statisticians illustrating the importance of certain host and environmental factors to the incidence of this disease. It recommends that prophylaxis, if used at all, be limited to those groups characterized epidemiologically as high-risk groups. Thus a procedure, once performed on every baby at birth can now be limited to a much reduced group of infants. In fact, the antibiotic treatment of the condition is now so effective that reliance can safely be placed on therapy instead of prevention. Of the 49 infants who developed gonorrheal ophthalmia during the three-year period of the study, none suffered serious eye injury or loss of vision.

Public Health Programs of the Present

In dealing with the health programs of the current period, a major priority will be the expansion of services within the familiar and useful patterns. An in-

teresting example of this is a recent program to improve the hospital care of premature infants. The Health Department maintains an elaborate program for hospital nursery inspection and an established set of standards for nurseries caring for premature infants. Since many premature infants are not born in hospitals with approved centers, a special day and night ambulance transport service has been provided. Despite such efforts, an insufficient number of approved beds is available to care for the premature infants born in New York City each year, particularly the largest number who are under 2,000 grams in weight. Hospitals have been reluctant to develop approved centers because of the high cost of the service.

Recently an opportunity arose which should make it possible to increase the number of approved beds. After discussions with the Department of Health the local Blue Cross Association is now prepared to add payment for premature infant care to its new family contract. It agreed that this care would be paid in full only if rendered in an approved center, thereby exerting pressure favoring the development of more approved centers. Table 2 indicates the existing resources and the unmet needs for this care. It is clear that even if all of the available beds in approved centers were used for the high priority group under 2,000 grams in weight, there would still be a shortage. Moreover, hospitals with approved nurseries will no doubt wish to utilize their special facilities for all premature infants born there, even for those who weigh over 2,000 grams. There are a number of fine points in the analysis, such as the proportion of infants born prematurely among various ethnic groups and the proportion of each group having Blue Cross coverage. These were shown to have no significant effect for practical planning. A number of hospitals, so far totaling more than half of the required beds, have already expressed interest in developing approved premature care facilities under a program of encouragement and consultation maintained by the Health Department. Thus a feasible means has been found to use a financial incentive on behalf of improved patient care for the premature infants in New York City.

Among the other major health programs of our current period is that dealing with the prevention of infant mortality. During the past five years infant mortality and perinatal mortality rates have shown an increase in New York City. Most of this increase can be explained by the changing ethnic composition of the population, but there were also some increases in ethnic specific

Table 2—Computation of Hospital Days of Care Required for Premature Infants in New York City (1959)

Weight Group	Estimated No. of Cases	Average Hospital Stay	Total Hospital Days	Minimal Hospital Beds Required
Under 2,000 grams	4,241	30.7	130,199	357
2,000 to 2,499 grams	3,168	19.1	60,509	166
Total	7,409		190,708	523
	Existing approved beds		108,400	297
		Deficit	82,308	226

Table 3—Factors Associated with Inadequate Prenatal Care, Riverside District, New York City—June, 1956

Factor	Per cent Receiving Adequate Care
Total group	34
Ethnic group	
White	50
Nonwhite	30
Puerto Rican	28
Husband in household	
Yes	41
No	13
Preschool children in household	
Yes	27
No	51

rates. The presently available resource which health departments emphasize is described by the broad term "adequate prenatal care." It has been defined more exactly as the administration of competent medical and nursing care to the patient beginning before the fourth month of pregnancy and consisting of at least eight additional visits during a normal-term pregnancy.

In one district of the city where the perinatal mortality rates were high it was found that only 34 per cent of the pregnant women had received prenatal care which was adequate by the above definition. Hence, we could state that our available resource had not been well utilized and research should be undertaken to see how this utilization might be improved. To discover the factors related to inadequate care, a small study was made[5] by interviewing 275 general service patients delivered during a one-month period who were residents of this particular district. Table 3 indicates the three factors, among the many studied, which were significantly associated with inadequate prenatal care. Further analysis showed that the presence of preschool children in the household was capable of exerting an independent influence (Table 4). This finding leads to speculation on the mechanism for this effect, and what corrective measures could be taken. Several possibilities are now being explored, such as nighttime prenatal clinics to permit husbands to act as baby sitters, making more clinics available in the patient's neighborhood, and daytime volunteer baby-sitter services either at patient's home or at the clinic. Some of these plans are now being put into practice.

A significant number of patients has actually been accepted in clinics nearer their homes after the department succeeded in persuading five hospitals to expand their prenatal clinic services. A program will also start soon in which a large teaching hospital will staff prenatal clinics at the district health center. After this occurs it is planned to schedule some night clinics. In addition, prenatal patients will be encouraged to bring their preschool children to the health center so that they can be seen in the well child conferences. Only a resurvey at some later date will indicate whether these measures have improved clinic utilization. The evaluation of the effectiveness of the prenatal care itself in the control of infant and perinatal mortality is another problem. For the present we have no choice but to accept and to admit freely that its value is assumed, attempt to improve its utilization, and hope to see its true effectiveness proved at some future date, either by ourselves or by some of our colleagues.

One of the favorite clichés of public health practice is the importance of building evaluation into the program. The program in turn must remain flexible so that prompt action can be taken when the feedback information indicates that this is desirable. Both of these principles can be illustrated by the history of the development of the New York City program for the control of cervical cancer.

The Department of Health first be-

came involved in a cancer detection center in 1947, when a cooperative program was established in an area of mid-Manhattan inhabited largely by middle class whites. For many years this was the city's only cancer detection center, and it is not surprising that it attracted a better educated clientele from a higher than average socioeconomic level. During the period 1947-1950, 1,305 females were given an extensive examination at the Kips Bay clinic (see Table 5) but only 3 per cent were nonwhites and 75 per cent of the women were Jewish. A total of four cancers of the cervix was found, giving a rate of 3.1 per 1,000 women examined.[6]

Since it is known that Jewish women have a low risk of developing cervical cancer in contrast to nonwhite and Puerto Rican women, it was decided to move the clinic to an area where the latter groups made up the large majority of the population. A clinic was opened in East Harlem in 1952. Much of the detailed physical examination which had slowed down the intake of patients at Kips Bay was omitted. A concerted effort was made to encourage the local residents to attend. Despite these efforts the East Harlem clientele was still largely composed of Jewish women, and the nonwhites and Puerto Ricans together made up only about one-quarter of the total. The rates for detected cancers were low.

Since the high-risk groups could not be persuaded to take advantage of this service, there was no choice but to

Table 4—Relationship of Several Factors to the Adequacy of Prenatal Care in the Riverside District of New York City

Ethnic Group	Husband in Household	Preschool Children in Household	Total Cases	Per cent Adequate Care
White	Yes	No	10	80
		Yes	17	41
	No	No	1	*
		Yes	1	*
Nonwhite	Yes	No	9	44
		Yes	14	29
	No	No	4	25
		Yes	13	23
Puerto Rican	Yes	No	13	62
		Yes	31	26
	No	No	4	0
		Yes	7	0

* Not computed.

Table 5—Comparative Yields of Cancer of the Cervix, Four Detection Programs

Clinic	Time Period	No. Females Examined	Per cent Nonwhite or Puerto Rican	Diagnosed Cancer of Cervix	
				Number	Rate per 1,000
Kips Bay	1947-1950	1,303	3	4	3.1
East Harlem	1958-1959	2,840	25	6	2.1
Social hygiene clinics	1958-1959	2,962	87	31	10.5
Harlem Hospital Admissions to Gyn. Service	1957-1958	8,972	99	49	5.5

change the original plan for a network of cancer detection clinics throughout the city. The most feasible arrangement for reaching the population with a high risk of cervical cancer was then to offer the cervical smear as a regular part of the examination for all women admitted to either the inpatient or outpatient service of local hospitals. Due to current shortages of trained cytologists, a program of this magnitude takes time to develop.

In the meantime, the Health Department noted that of the 12,000 females currently being treated in its social hygiene clinics, 3,600 were over 30 and 3,130 (87 per cent) were nonwhite or Puerto Rican. During 1956, the cervical smear program was begun as a routine in a few social hygiene clinics and by 1960 had been extended to all of them. In the two-year period 1958-1959 the yield of cervical cancer among these patients was 10.5 per 1,000. As Table 5 indicates, this yield was several times greater than that for the East Harlem cancer detection clinic during the same period of time.[7] Moreover, in a group of females being routinely examined and tested for gonorrhea the test could be performed with very little added effort. The development of this program also led the department to step up its cytotechnician training program and to prepare a careful protocol for examination upon hospital admission. Thus the program for detection of cancer of the cervix became feasible, it produced an appreciable yield of cancer cases, and had a strong "multiplier" effect upon our future detection program among women admitted to hospitals.

The latter program was started in the Harlem Hospital gynecology service in 1957. By 1960 it had become a full-scale program for testing virtually every female inpatient and outpatient admitted to the two large municipal hospitals which serve the Harlem community. The data for the transition period 1957-1958 are shown in Table 5. A significant number of cases of cervical cancer (5.5 per 1,000 women tested) can be found in this high-risk group.[7] It has been estimated that a single case of fatal cervical cancer costs the City of New York $10,000 from time of discovery to the time of death. In our experience[8] one-half the cases would not have been detected without the cervical smear, and of these more than two-thirds can be saved at the time of diagnosis. These patients therefore represent the minimum potential financial saving due to the

cytological program, which amounts to more than $160,000. It is expected that each year 75,000 women will be tested at each of the two hospitals in the Harlem area. If current yield rates hold, about 825 cases of cervical cancer will be detected and save an estimated 275 lives. The financial saving from the care of this group would be $2,750,000 for a program whose cost is estimated at less than one-tenth of that amount.

Public Health Programs for the Future

I suggest that every health officer study Table 6 carefully and thoughtfully. It represents a fairly comprehensive list of the public health problems of the future. In fact, it is rather startling to realize that of the 20 leading causes of death listed in this table only two, influenza-pneumonia and tuberculosis, are conditions which are sufficiently understood today so that they could be controlled more completely. The other 18,* with the addition of several nonfatal conditions such as common cold, glaucoma, mental health, and arthritis, continue to baffle us. Such resources as are available, promising though they may be, have not yet proved capable of causing any significant, community-wide impact upon these conditions.

Although at any given time there will always be a group of leading causes of death and disability, the existence of effective measures for their control would make it possible to develop major service programs. When, however, as is true today, these measures do not exist, then the health officer's major priority for the present must be (a) "research" to develop new resources, and (b) "demonstration" to test and improve the effectiveness and efficiency of those resources we have.

The performance of research to develop new resources and to add to our knowledge of disease control is a familiar story in New York City. Important epidemiologic studies have contributed to our knowledge of rickettsialpox, poliomyelitis, influenza, and heart disease. The department is now giving high priority to both an extensive intramural and an extramural research program.[9]

Rather than discussing further some of our current research efforts which fit the generally familiar patterns of research design, it might be more useful to describe one of our demonstration efforts in program development. Adult rehabilitation is a field in which excellent programs have been created for working with specific patients, but where there are not as yet effective programs for an entire community. It is a costly service, and one cannot afford to have it used by those with only a slight hope of improvement in the activities of daily living. On the other hand, if it is of value only to an infinitestimal portion of the afflicted, then it requires little promotion. The New York City Health Department is engaged in a community-wide rehabilitation demonstration in its Corona district, an area of 200,000 population aimed at testing some of these concepts in a practical program.[10]

A demonstration project should be looked upon as an opportunity to experiment with new technics and to develop new yardsticks. Rather than resenting the appearance of difficulties, we should welcome them, understand them, and learn how to prevent, circumvent, or overcome them. Table 1 lists the major reasons why a demonstration effort to develop a future health program should be afforded a high priority, and the Corona project illustrates each of them. The ensuing discussion will deal with only one small phase of the last item on the list—a part of the gradual develop-

* Within the cancer group cancer of the cervix is an exception. Lung cancer is not an exception, since even though we accept the cigarette hypothesis, we have not yet found ways of reducing the smoking habit appreciably, nor do we yet have any real clues as to how this can be done.

Table 6—Leading Causes of Death: By Color, Sex, and Rank, New York City, 1959

Cause	All Persons		White						Nonwhite					
			Total		Male		Female		Total		Male		Female	
	No.	Rank	No.	Rank	No.	Rank	No.	Rank	No.	Rank	No.	Rank	No.	Rank
All Causes	85,352		74,964		41,916		33,048		10,388		5,789		4,599	
Diseases of the heart (410-443)	36,686	1	33,642	1	19,158	1	14,484	1	3,044	1	1,621	1	1,423	1
Malignant neoplasms (140-205)	16,883	2	15,276	2	8,218	2	7,058	2	1,607	2	867	2	740	2
Vascular lesions of central nervous system (330-334)	6,346	3	5,696	3	2,557	3	3,139	3	650	5	291	6	359	4
Influenza and pneumonia (480-493)	3,790	4	3,072	4	1,727	4	1,345	4	718	4	424	4	294	5
Certain diseases of early infancy (760-776)	2,961	5	1,900	6	1,091	7	809	6	1,061	3	612	3	449	3
Accidents (800-962)	2,655	6	2,182	5	1,422	5	760	7	473	6	351	5	122	7
Cirrhosis of the liver (581)	1,947	7	1,625	7	1,117	6	508	9	322	7	207	7	115	8
Diabetes mellitus (260)	1,583	8	1,375	8	545	8	830	5	208	10	71	11	137	6
General arteriosclerosis (450)	1,134	9	1,030	9	470	10	560	8	104	12	45	15	59	11
Congenital malformations (750-759)	956	10	794	10	440	11	354	10	162	11	83	10	79	10
Tuberculosis, all forms (001-019)	779	11	493	13	388	13	105	18	286	8	185	8	101	9
Suicides (963, 970-979)	768	12	693	11	437	12	256	11	75	15	50	13	25	16
Ulcer of stomach and duodenum (540-541)	744	13	684	12	497	9	187	14	60	16	45	15	15	18
Hypertension without mention of heart disease (444-447)	550	14	446	15	231	17	215	12	104	12	53	12	51	12
Other diseases of circulatory system (451-468)	529	15	477	14	299	14	178	15	52	17	27	19	25	16
Chronic Nephritis (592-594)	512	16	422	16	232	16	190	13	90	14	49	14	41	14
Hernia and intestinal obstruction (560, 561, 570)	410	17	360	17	190	18	170	16	50	19	36	17	14	19
Homicides (964, 965, 980-999)	409	18	197	20	140	19	57	19	212	9	161	9	51	12
Benign and unspecified neoplasms (210-239)	328	19	276	19	127	20	149	17	52	17	17	20	35	15
Hyperplasia of prostate (610)	321	20	292	18	292	15	—	—	29	20	29	18	—	—
All other causes	5,061		4,032		2,338		1,694		1,029		565		464	

The rules used in ranking causes of death are given in "Leading Causes of Death: United States and Each State, 1949." National Office of Vital Statistics. Vital Statistics—Special Reports. Vol. 36, No. 20, 1952.

ment of the future program in rehabilitation in our department.

In starting a community program in rehabilitation, one must set up a procedure for case finding. Such a program should be as comprehensive, workable, cheap, accurate, and acceptable as possible. At the start the following methods were tried with the indicated results.[11]

During June and July of 1959, a questionnaire was mailed to 220 patients whose care had been terminated according to the files of the Bureau of Handicapped Children. All were at least 21 years old at this time. They were selected from a group of 352 children registered with the bureau because of some neuromuscular-skeletal condition, whose follow-up was terminated between 1938 and 1954, and whose last recorded address was in the service area of the Corona rehabilitation project.

One hundred and two or 47 per cent of the 220 were not traced. Seventy per cent (83) of the remaining 112, presumably still in the area, did not reply. Of the 35 who were reached, three were found to have died of unrelated causes, 20 stated they had no physical impairment, and 12 reported varying degrees of residual handicap which in no instance was said to prevent working or caring for home and family. This could hardly be called a useful case-finding procedure.

With the help of the county medical society, a fairly large group of general practitioners and internists with offices in the Borough of Queens (640 in all) was contacted by letter. The letter was designed to serve a three-fold purpose—to notify the physicians of the existence and objectives of the project; to ascertain what needs they felt for various resources useful in carrying out a program of patient rehabilitation in the home; and to find out for how many cases of cerebral vascular accident each physician was currently responsible.

Fifty-three per cent of the doctors returned answered questionnaires. Twenty per cent of those who replied stated they were currently caring for patients with cerebral vascular accident. The total number of the patients said to be under care amounted to 147. However, follow-up interviews with the physicians reporting cases under care brought the number down to 42 and two-thirds of these (28) were said to have no residual impairment. We thus ended up with 14 patients suffering from varying degrees of disability. Again, this was not an effective case-finding method.

From early January, 1960, through the end of June, 1960, a household survey was carried out. An area probability sample was used designed to cover 7.5 per cent of the total Corona Health District population, based upon an estimate of 2.3 persons per household. Included in the sample were 6,500 households.

The questions were designed to find persons with some diagnosed neuromuscular-skeletal condition which results in physical abnormality and/or impairs their ability to care for themselves, to get around in the community, or to pursue already established major occupational interests.

At first an attempt was made to carry out the survey by means of volunteers recruited from the community. A team of health educators contacted and spoke before most of the civic, religious, and fraternal organizations in the area. Community interest in the total Corona project was very high. The educational aspect of the campaign proved most successful. During the first two months of operation of the health education team, self and community lay referrals to the project jumped from zero the month before to 15 or 22 per cent of the total referrals for the period. Volunteer recruitment proceeded, but at a slow pace. The survey requirement of a fairly rigid interviewing schedule, in-

Table 7—Household Surveys—Corona Rehabilitation Program—1960

	Households Reached		Persons Interviewed		Positive Responses		Nurse Validations of Positive Responses			
							Total Valid		New Cases with Disability	
	No.	%	No.	%	No.	% Interviewed	No.	% Interviewed	No.	% Interviewed
Volunteer interviewer contact	1,358	23	3,992	23	117	2.9	55	1.4	43	1.1
Paid interviewer contact	4,030	67	11,877	69	658	5.5	331	2.8	236	2.0
Other types of contact	606	10	1,451	8	70	4.8	27	1.9	18	1.2
Total	5,994	100	17,320	100	845	4.9	413	2.4	297	1.7

cluding night calls, and the necessity for the volunteer to commit himself to a minimum time contribution, eliminated many potentially willing workers. Orienting individual volunteers proved time-consuming and unsuccessful. As a result, in March, after about 20 per cent of the households had been reached by this method, volunteer recruitment was terminated.

In early April, a group of 20 college students and Health Department personnel were hired and oriented. Under supervision, they carried out the major portion of the survey. These interviewers worked in the evenings from 6 p.m. to 9 p.m., and during the day on weekends. At each household the interviewer made three attempts to complete the questionnaire through an interview with a responsible adult. Return visits were made to all households where the interviewer met with an uncooperative respondent as well as to those where no one was at home. On the third visit, if the questionnaire could not be administered, it was left, with a letter, a return address envelope, and a request that the householder return it by mail. A complete list of such household names and addresses was kept.

Several weeks after the mail return was left, a list of all nonresponding households was compiled and, using a reverse order telephone book, the telephone numbers, if any, were recorded. Two attempts were made to reach each of these households by phone.

Finally, those households not reached by any of the above methods were regarded as a hard core. A 10 per cent random sample of each tract's hard core was selected, and an intensive effort by visit, mail, and telephone was made to reach these households. The purpose was to be sure that this group did not differ materially from all others. Having reached approximately 70 per cent of them, their similarity to the total sample was confirmed.

In all, 5,994 households (over 90 per cent of the original sample) were reached, covering almost 17,320 persons. There were 845 reports of presumptive neuromuscular-skeletal disorders turned in by the interviewers, a tentative prevalence rate of 4.9 per 100 persons. Table 7 indicates that the volunteer interviewer

performed only one-quarter of the total task offered, and that the paid interviewer was essential for the completion of the job. It is also noteworthy that the paid interviewer was almost twice as successful as the volunteer in finding presumptive candidates for rehabilitation among the persons interviewed.

Before any further conclusions could be drawn, the presumptive cases had to be validated. The first validation was done by having a public health nurse visit each such patient. The nurse took a rather lengthy case history which included diagnosis, medical care, functional capacity and patient's complaints. Table 7 shows the results of the nurse validations. The yield of each interviewer group is reduced equally by the validation procedure for both total valid cases and new cases with disability. Since the paid interviewer had a higher yield of positive responses to begin with, we note that he maintains this same proportionate advantage over the volunteer interviewer after the nurse validation.

The next step in the refinement of this case-finding yardstick is to obtain a medical validation for each of the 297 potential new cases with disability. Table 8 shows the data for the few which have been done to date. After a record review of 109 of the new cases validated by the nurses, the physiatrists recommended 40 (37 per cent) for the physical examination. Of the 11 patients who have received this examination, almost all were recommended for rehabilitation. Although the figures are small, it can be seen that the paid interviewer yield continues to hold its own. Hence, on the basis of these preliminary findings in a new community demonstration program in New York City, it appears that the paid interviewer is the recommended first step as a practical means of finding a significant number of disabled persons who were otherwise unknown to the program.

Discussion

These examples of the use of quantitative data in program planning and evaluation cannot hold their own in scientific sophistication with the elaborate statistical designs used in our epidemiological studies and clinical trials. They do, however, have several important virtues. They were each performed deliberately to answer a specific problem in public health practice and in each case an answer was obtained. In each case some deliberate action was

Table 8—Physician Validations of Prospective Patients Found on Interview, Corona Rehabilitation Program—1960

	Physician Case Record Review Total	Recommended for Physical Exam.		Examined	Recommended for Rehabilitation
		No.	Per cent		
Volunteer interviewer contact	9	3	33	1	0
Paid interviewer contact	91	34	37	7	7
Other types of contact	9	3	33	3	3
Total	109	40	37	11	10

taken or is now being taken because of the nature of the answer. In each case the staff was prepared for at least one alternate answer and would not have followed the program direction it finally did follow had the answer been different.

While it is true that crude data of this kind must be presented with true scientific humility, the important thing is that they be presented openly. Criticism of such studies must be encouraged, next steps suggested and pursued vigorously, if we are to lift public health practice from its smug security as an "art" to a position much closer to the cross-fire of scientific scrutiny.

We must seek a true remarriage of epidemiology and statistics on one hand with public health practice on the other. The responsibility for tying the marital knot rests equally with all parties. Epidemiologists must learn to accept the more difficult challenges posed by evaluation research. Statisticians must drop their preoccupation with unduplicated counts of patients' noses in favor of more elaborate designs for feedback, yardstick research, and streamlining of activities. Public health practitioners should cease placing their major reliance upon expertise based upon mythical standards floating on seas of unvalidated assumptions. Most important of all is the responsibility of the practitioner to act upon the results of such research when it is performed. Unless such action is taken, the whole difficult business becomes a mere exercise in measurement, a pleasant interlude between the expert dogmas, "enlightened" experience and cookbook training which will then continue to guide our programs. Perhaps, all this was not needed as much one or two decades ago when we were struggling against disease armed with weapons of proved merit. Today, as we face a future of complex problems, with resources so inadequate for their solution, let us return once more to those quantitative statistical and epidemiological principles with which we won our victories over the diseases of the past era.

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A study was made in Denver secondary schools to collect data on the incidence and degree of dysmenorrhea. The authors conclude that menstrual distress is more frequent than is often supposed, and suggest that more research and attention to this problem is needed.

A SURVEY OF MENSTRUAL FUNCTION AMONG 1,668 SECONDARY SCHOOL GIRLS AND 720 WOMEN EMPLOYEES OF THE DENVER PUBLIC SCHOOLS

Mildred E. Doster, M.D., F.A.P.H.A.; A. Louise McNiff; John M. Lampe, M.D.; and Leland M. Corliss, M.D.

Purpose of the Survey

THE INCIDENCE of dysmenorrhea in our secondary schools seemed to vary considerably. The reasons were sought by questionnaire in the school year 1958-1959. Data were collected and analyzed in order (1) to ascertain reasons, if possible, for the observed differences in dysmenorrhea among students in the secondary schools, and (2) incidentally to find the incidence of dysmenorrhea and to learn better ways of dealing with it.

Development of the Method Used

In 1958, inquiries were made to 14 large city school systems for information as to the known incidence of dysmenorrhea among their older girls. Two (Los Angeles and Philadelphia) reported somewhat similar surveys to the one being contemplated in Denver but did not include some of the questions being considered for this survey. We were hopeful that sufficient details could be learned about the dysmenorrhea to judge how genuine and intense was the discomfort being reported by the secondary school girls.

Before the tabulated results are discussed, let us summarize the development and content of the questionnaire. Two years ago an advisory medical committee of six physicians representing gynecology, psychiatry, pediatrics, and college physicians was invited to work with the public school health service and instruction departments to suggest the content and use of the questionnaire. The school nurses, health supervisor, and physical education departments were also represented on the advisory committee. We were aware of two limitations of the questionnaire method—first, it obtains only subjective information and does not allow correlation with clinical or organic findings and, second, it might permit individual answers to be influenced by group associates.

A trial run of the questionnaire was made in the summer of 1958 with 460 young teachers and clerical personnel (mostly aged 22-25 years) and with 260 lunchroom workers (mostly aged 35-55

years). This trial showed the need for some revisions in order to obtain clearer answers to some of the questions. One inquiry asked the known maternal history of dysmenorrhea and gave a revealing relationship. Of the 65 per cent of the total group of 720 adult employees who reported past or present painful periods, half of them said their mothers had had menstrual distress, while the rest of this group (35 per cent) reported only 1 per cent of their mothers had experienced painful menses. Later this question was deleted when the survey was made among secondary school girls, as it was thought indiscreet to seek this information. However, it would be an interesting family pattern to evaluate further.

Related Data Already Published

In earlier medical reports,[1] 6.3 per cent of a group of Baltimore girls were found to have one day or more in bed each period; 17 per cent of 785 college students and nurses in Iowa in 1927 had pain sufficiently severe to require bed rest or limited activities; and 10.5 per cent of 1,066 high school girls in Los Angeles had sufficient menstrual distress to necessitate loss of school or lying down during class hours in the cot room the first and sometimes second day of the period. In Philadelphia,[2] 16,183 high school girls were surveyed in 1957 and 30 per cent reported "frequent" dysmenorrhea, 35 per cent "occasional," while 33 per cent had no discomfort during menstruation. Among students in the 16 high schools there was considerable variation from 13 per cent to 60 per cent, with the highest incidence of dysmenorrhea among Negro girls. Earlier the same author[3] in Philadelphia surveyed four schools for incidence of dysmenorrhea and tried group therapy in two of the schools. At the beginning of the study the four schools reported dysmenorrhea in 28 per cent, 40 per cent, 42 per cent, and 45 per cent of the girls, respectively. The two control schools showed no significant change throughout the study period.

Six months after group psychotherapy was instituted the two experimental schools likewise showed no significant change. The conclusion was that "the great majority of dysmenorrheic patients are not psychoneurotic" although the writer had assumed earlier that they were. At the end of the study, about 20 per cent of those who initially complained of it no longer had dysmenorrhea but about 15 per cent who were free of dysmenorrhea at the start of the study had developed it by the end of the study. Dr. Golub in Philadelphia has continued these surveys[4,5] and reported about half of the high school group being studied experienced premenstrual and menstrual discomfort.

In 1944, pain thresholds were studied[6] to ascertain the sensitivity of those who complain of dysmenorrhea. The studies suggested that dysmenorrheic women responded to pain more readily than did nondysmenorrheic women. Adolescent menstrual patterns have been analyzed,[7] and it was stated that "The disturbance of menstrual and reproductive function exhibited by the adolescent organism are but an outward manifestation of the complexity of the process of sexual maturation." It is obvious to all who work in the field of gynecology, adolescent clinics, or secondary school counseling that much knowledge is still lacking to explain all the details of the process. An interesting observation, probably first published in 1940 by Sturgis, is that some girls do not develop pain until a year or two after menarche is established, presumably because the early periods are anovulatory, and only as ovulation is established with more mature pituitary function do "cramps" begin. In human beings it is known that estrogen secretion usually has a slight rise about eight years of age and

a great increase at about 11 years of age.

Drs. Torpin, Woodbury, and Child[8] in 1947 summarized the major studies on the incidence and cause of dysmenorrhea up to that time. They concluded that about "one-third of all young women in America are afflicted." In industry, it was estimated that 140 million hours were lost annually to this condition and that this represented a whole year of work for 58,000 women.

These authors traced the theories and treatment of dysmenorrhea in this century including the early and simple one of obstruction of the cervical canal; hypoplasia of the uterus; psychogenic causes; endocrine imbalances; toxic substances in the menstrum; and an irritable myometria. They also appraised a multitude of treatments from placebos to recent fancy endocrine mixtures. Since all have given relief to some, but none give relief to all, one can say only that dysmenorrhea is related to varied myoneural, vascular, endometrial, and psychological factors and remains a complex syndrome requiring further study.

The psychological aspects were studied[9] in Peter Bent Brigham clinics in Boston in 1953. The most common psychiatric problem found in women with dysmenorrhea was the difficulty of accepting adult feminine responsibilities. Usually they could be helped considerably by patient and sympathetic counsel.

Recent general articles on dysmenorrhea have been written from the Adolescent Unit of Children's Hospital in Boston[10] and the Gynecology Department of Tufts University School of Medicine in Boston.[11]

The latter is a very comprehensive analysis of menstrual alterations from systemic diseases and psychic influences.

Also in 1958, Harris[12] reviewed the endocrinology of the female stressing the dynamic and changing balance of the various hormones. This makes accurate therapy very difficult and accounts for the varied and haphazard and often ineffective medical treatment at the present time.

Findings of the Survey

Within the limits of the following questionnaire, accurate information was sought as to the prevalence and degree of discomfort and the amount of interference to normal activities that was experienced by the dysmenorrheic girls.

Questionnaire to Older Girls and Young Women About Menstrual Function

It will be helpful to the schools if you would kindly fill out the following as accurately as possible.

1. What is your present age? (to the nearest ½ year) .....

2. At what age did you start menstruation? .....
   (Answer to the nearest ½ year: as 12 yr., 12½ yr., 13 yr., etc.)

   a. How often does it usually occur? Every 28 days, 30 days, etc. .....

   b. Is it regular at least 80 per cent of the months? ..... Yes___ No___

3. Do you consider you have sufficient distress at your periods to call it "dysmenorrhea"—i.e., painful menses? ..... Yes___ No___

   a. Is it usually severe enough to keep you home from school? ..... Yes___ No___
   (For a half day___, a whole day___, more than a day___)

   b. Who suggests you remain at home?
   Your mother___ You___ Other.....

c. Do you miss some school every time? .....
If not, how often?.....

d. Do you need to go to bed for relief? ..... Yes___ No___

e. Do you have to give up some of your best liked pleasures if they occur when you menstruate? ..... Yes___ No___

f. Have you ever consulted a doctor about the pain? ..... Yes___ No___

g. Does it require medication? ..... Yes___ No___
If so, what have you found most helpful? .....
.....

h. Is the flow prolonged? (Beyond 6 days) ..... Yes___ No___

i. Have you had some superstitions to overcome? ..... Yes___ No___

Describe briefly: .....
.....

We would appreciate your signature in case we need to clarify any further details.

Name .....Grade .....

School .....Date .....

Of the total of 1,410 senior high school girls and 258 junior high school girls, 38 per cent said they had "dysmenorrhea." Among this dysmenorrheic group, 67 per cent said it was severe enough to necessitate missing some school; about 45 per cent said they missed some school every period; about 84 per cent had to give up some of their pleasures during the menstrual period; about 80 per cent needed to go to bed for relief; about 38 per cent had consulted a physician for the distress; and about 73 per cent said the pain required medication. Of the total group of 1,668 girls, 13 per cent had had superstitions to overcome. Bathing, washing hair, getting feet wet, eating certain foods, and the need to avoid all exercise lead the list of superstitions.

When the questionnaire was tried initially on 720 women employees of the Denver schools during their preemployment medical examinations in the summer of 1958, results were similar to those reported by the high school girls. The lunchroom workers, however, reported they established menarche at somewhat earlier years than did the group of teachers and clerical personnel as presented in the tabulation on page 1845.

Additional information was gleaned from the health histories of 500 college women from 19 to 24 years of age. The earliest menarche was eight years of age and the latest (in five individuals) during the 16th year. Sufficient dysmenorrhea occurred in 11 per cent to cause them to stay home "regularly" during the period, and another 14 per cent "sometimes" during the menses. Twenty-five per cent took medicine "regularly" and 10 per cent "sometimes" during their menstrual periods. As to length of menstrual flow, for 33 per cent it lasted six days or more. The interval between periods was from 15 days to 46 days in 90 per cent of all these young women, and 76 per cent had periods regularly spaced at from 25 to 32 day intervals.

General Summary and Conclusions

1. By questionnaires, data were accumulated regarding the menstrual proc-

ess, and particularly the incidence and degree of dysmenorrhea, among 1,668 girls (14-19 years of age) in seven secondary schools. A trial group of 720 women had been studied by a similar questionnaire and the health histories of 500 more college women (19-29 years of age) were analyzed for comparative and substantiating data.

2. The reported incidence of dysmenorrhea varied with 38 per cent of the adolescent girls, 69 per cent of the teacher and clerical group, 58 per cent of the lunchroom workers, and 25 per cent of the college group stating they had had or still had painful menses. These periods were sufficiently uncomfortable to interfere either regularly or occasionally with the usual activities in 25 per cent of the college age and in 34 per cent of the secondary school group.

3. The reported incidence of dysmenorrhea proved to be quite consistent among all groups of girls although the complaints coming to the school nurses varied considerably from school to school. For instance, racial or economic differences did not seem to influence the incidence among the five high schools—wherein 40 per cent, 39 per cent, 40 per cent, 41 per cent, and 46 per cent of the young women reported dysmenorrhea either presently or in the past. The two junior high schools surveyed showed 35 per cent and 23 per cent incidence of the girls had painful menses.

4. Apparently, menstrual distress is more frequent than is often supposed and must be considered an important health problem among older girls and women. Therefore continued basic research and more attention to treatment of dysmenorrhea are needed to prevent periodic discomfort and absenteeism.

	Young Teachers and Clerical Personnel (460) %	Lunchroom Workers (260) %	Total (720) %
Per cent menstruating by end of 11th year of age	14	26	24
Peak year for established menarche	13th—(34%)	12th—(30%)	40% during 13th year
Per cent who did not menstruate until after 14th year of age	12	None reported	
Per cent who have, or have had, dysmenorrhea	69	58	65
Per cent who still have dysmenorrhea	57	43	53
Per cent who have dysmenorrhea regularly	32	56	36
Per cent who started their dysmenorrhea after 15 years of age	50.6	66	55
Per cent with pain occurring only first few hours or first day	75.8	81	64

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Proceedings: Airborne Communicable Diseases

A Conference on Airborne Infection organized by the Division of Medical Sciences, National Academy of Sciences—National Research Council was held in Miami Beach, December 7 to 10, 1960. The proceedings of the conference are published in the September, 1961, issue of the American Society for Microbiology's "Bacteriological Reviews." The purpose of the conference was "to seek an informed contemporary reassessment of the significance of the airborne route in the dissemination of communicable diseases." Part I of the proceedings is the keynote address made to the conference by Alexander D. Langmuir on Epidemiology of Airborne Infection. The other parts are devoted to papers on: Airborne Organisms, Respiratory System and Airborne Infection, Bacterial Diseases, Virus and Fungus Diseases, and Immunology and Public Health. Part VII is a critique by the conference chairman, Walsh McDermott. Single copies from Williams & Wilkins, 428 East Preston St., Baltimore 2, Md., at $1.50.

The physical growth and development of children has important connections with their behavior. Some aspects of this topic are reviewed here, and the author suggests problems that require investigation.

DEVELOPMENTAL ASPECTS OF CHILD BEHAVIOR

Frances Ilg, M.D.

IT HAS always been fascinating to see how much one can grasp about a child in the first meeting in the reception room. The quick appraisal of his physique can give a strong initial clue as to the kind of a child he is. He may be viewed in such simple terms as—e.g., is he round and soft; square and muscular; slender and scrawny. How does he comport his body? Is he sitting on the couch with his feet under him or his knees drawn up like a four-year-old, or does he preter to sit in a separate chair with one leg externally rotated with the ankle resting on his other thigh like a nine-year-old. In this first meeting we can glimpse both the individuality of the child as it relates to his physique, and the age of the child as it is expressed in his behavior. This kind of appraisal can be greatly sharpened if we have a background of knowledge and experience.

Let us for a moment take a look at physique and see how it varies. The work of William Sheldon in constitutional medicine has been the basis of our work in this field with children. Sheldon has separated physique into three categories—endomorphic, mesomorphic, and ectomorphic—deriving these names from the three anlagen of the germ plasm: endoderm, mesoderm, and ectoderm. Each individual is made up of all three components, but one or the other may predominate.

Since the endoderm produces the organs of digestion and as digestion goes with the deposition of fat, we come to know that these individuals actually have a longer intestinal tract, that they live to eat and that control of weight becomes a very real and necessary problem for them to solve. This fat component is higher in the female. One can readily realize that sociability, especially in relation to eating, can be very important to this kind of a person.

The second component, mesoderm, produces muscles, blood vessels and bones. The contour of a mesomorphic physique is square or cubical—a square lateral chin line. This component is higher in the male. It is no wonder that everything about the mesomorph is ready for action. He needs to exercise.

The last and third component, ectoderm, produces nervous tissue and skin. Here the resulting contour is linear. Thus the ectomorph's contours tend to be long and slender. The face is long, the neck is long, the hand is narrow with long fingers, the extremities are long and slender. This type of individual is more solitary. He needs separation to think. Often he is immature and needs more time for growing.

With Sheldon, we feel that structure determines function. But the correlation of structure and function in our present research with children is only in a beginning phase. Yet I find that there

are certain correlations of structure or physique with behavior that are surprisingly evident and very useful to know about.

For example, there is a certain type of educational problem related to low motivation that I consider more prevalent in an endomorphic child, especially a boy. This type of child often puzzles the educator, especially if he has a high I.Q. and gives the general impression of being a gifted child. These are also the children of promise who throw themselves into a new experience with great gusto and do remarkably well initially. Their first grade record is often brilliant. But by the time they reach the fourth grade where the work is more demanding and more effort is required from them, they all too often slouch, procrastinate, idle, and do not do the work assigned or have difficulty in turning it in on time. They are past masters at making excuses. It is indeed hard to know how to handle these boys educationally. It is true that when pressure and strong demands are made upon them at a crucial moment, the impact seems to pull them into line and helps them to produce. But if nagged and pressured all the time, they are either shattered or they lose their ability to respond. However, when they are emotionally involved and interested in what they are doing they give themselves unstintingly to a task until their interest burns out. The problem is one of balance. They need to be given outlets and opportunities to follow their interests and talents. But at the same time certain demands need to be made of them. They respond best at crucial moments when they can be almost exploded into action. A strong impact seems to organize them by providing a stimulus that they lack within themselves.

Or let us take a mesomorphic example, with children who are motor driven and who act impulsively. These children seem to lack an inhibitor response. These are the preschoolers who exhaust their caretakers and who need to be supervised every minute. I often say they need an assembly line of as many as five persons, so that one after the other can take over as each one drops from exhaustion. This problem is not related alone to mesomorphy, but mesomorphy is often significantly present in these children. The Gluecks in their very important studies on delinquency have frequently pointed out the presence of this mesomorphic component in the children they have studied. Control and the following of rules become important in the handling of these children. Moreover, directives need to be repeated over and over again since there seems to be a lack of carry-over from one situation to the next with this type of child. There must be a faulty integration here because their lives seem to be a series of episodes, one after the other without the usual link of relationship.

A third example in the field of ectomorphy might be the problem of enuresis. Part of the problem may well be related to a more characteristic immaturity in the ectomorph along with a lack of full integration. The ectomorph's emotional immaturity is a part of his total immaturity. One can use various methods in hopes that bladder control will be developed, but if the more usual methods do not and have not worked by the age of eight years we feel that some conditioning device is indicated. It is as though some new specific stimulus is needed to complete the necessary proper nerve hook-up. This need for conditioning is especially indicated if the child wets persistently and repeatedly during the night and as early as one hour after he has fallen asleep. Our experience has not revealed the harm others predict in the use of a conditioning device. We find that it allows, often within a two-week period of conditioning, for growth that should have already occurred by four years of age, with an outer limit at

eight years. Other changes for the better often take place in a child when this problem of bed-wetting is no longer present.

Now let us consider growth as it unfolds in what we have come to see as stages within cycles. We came to recognize that growth stages repeated themselves; that the same kind of behavior may be found at different ages. When, for example, one has experienced the resistant, conflict-laden and explosive responses of two and a half-year-old behavior there is a dormant residual memory that is awakened when this behavior reoccurs at five and a half years of age.

We were slow to see these stages in sequence. It was actually not until we had completed our research on the five-to-ten-year-old that we realized there were in this period six stages of growth that showed definite and changing characteristics in sequence.

The five-year-old we found to be compact, well knit, and well put together. "Nice" is the word that best describes him and "nice" is the word that is uppermost in his mind.

This smoothness of five made the succeeding stage of five and a half to six almost unaccountable. Here we found a state of seething, boiling, and bubbling with all of its resistant and explosive points.

Fortunately this stage passes to be followed by a relatively mature phase at six and a half years. Growth seems to harness the preceding forces let loose at five and a half to six years of age.

But further growth brings further changes. The looser harnessing of six and a half becomes the tighter harnessing of seven as expressed in an "inwardizing" process. Seven can withdraw. He can whisper. He is aware of details. This is an age when nearsightedness may have its onset.

Following this pulled-in stage is the release into eight years of age when a new, wider totality seems to be grasped and when there is a new capacity to tackle and to experience. It is like the crest of a wave, whereas seven may be likened unto the trough.

Then comes nine years of age when there is an intricate development of the patterning of inner and outer forces, an interweaving of all that has gone before from five to eight years of age. The fully moving nine-year-old is very evident in fourth grade. He is like cream that rises to the top, whereas a less fortunate nine is like dregs that fall to the bottom.

With this greater integration at nine, life smooths out into ten-year-old behavior when a stage similar to five years of age reoccurs. Again one can use the adjective "nice" to describe the age. Again one notices the easy smooth relationship ten has with his mother, so similar as to five.

When we finished our study on the five-to-ten-year-old we looked back at our preschool studies and found the same recurring stages there. The two-year-old had the same nice quality observed at both five and ten. The two and a half-year-old had that "terrible" quality of five and a half. Three reminded us of six and a half; he, too, was more aware of the other person. You could bargain with him. Three and a half had that unmistakable quality of seven with his tendency to "inwardize." (Though three and a half could express his inner tensions and anxieties more openly than seven, who often kept them to himself.) Four burst forth just as eight had done. The world seemed to be his, wherefore he needed to be given limits so he would not go out of bounds. Then came four and a half so similar to nine when a very special kind of integrative order can occur. His very question "is it real?" makes one know that he is grappling with basic things.

It was indeed with a new state of adventure that we launched forth on our research into aspect of behavior in the

ages beyond ten. We did not yet know where the next stopping point would be. We were guarded in our observations, fearing that our preconceived ideas would influence our results. But it soon became apparent that behavior would speak for itself.

There was no doubt about the break-up that came at 11 with all of its seething forces so similar to five and a half and two and a half. The hallmark of the age we soon realized was a derogatory "she" used to designate Mother.

Twelve was a respite, just as six and a half and three had been, only to be followed by the withdrawal and "inwardizing" of 13 years of age so reminiscent of seven and three and a half. Thirteen's slumped posture with his head bent forward told of his inward state; and his small handwriting also told of the intensity and precision of his inward thinking.

Again an outward thrust occurred at 14 when the child could stand up straight and meet the world again. His social life zoomed. And again this stage was followed by the more intricate reorganization that occurred at 15, so similar to nine and four and a half, which in turn would smooth out into 16, a full cycle round.

We were not only struck by the fact that the cycles repeated themselves, but that they steadily slowed down. We noted that the cycle from two to five took only three years, from five to ten, five years, and from 10 to 16, six years.

As we came to believe in the validity of the cyclical theory, we became increasingly interested to know whether all children went through all the stages. Our present opinion is that perhaps only a third show the stages as clearly as we have described them. Another third seem to highlight certain stages which are in keeping with their own individuality, thus minimizing other stages. And the final third may well be a group that shows neither age nor individuality very clearly. They are the children who differentiate poorly and who need environmental stimulation to boost and support them. These are often the children who need remedial action.

We may now try to put some of this knowledge to use in a way that might have public health significance. I have always been intrigued by the way a child falls and where he is most apt to land. At 15 months or younger he is apt to roll up in a ball and hit his forehead. I wish more simple harnessing could be used in this stage of early walking even up to two years of age to help break a child's fall if and when this happens.

By two and a half the child is more apt to land on his nose, and often gets a bloody one. By four he strikes his mouth and often knocks out his front teeth. As his balance shifts at six he is apt to break his arm as he extends it to break his fall. This may occur as he walks fences which he loves to do. Whether statistics would bear me out concerning a broken collar bone at five years, I am not sure. But I have seen this often enough to wonder whether it might not be a part of this story of shifting balance. This story is further enhanced by the occurrence of a broken leg at eight years when the tendency is for the child to land on his feet.

Even illnesses, I feel, have an age and individuality relationship. I am especially concerned about illnesses at the break-up stages of two and a half, five and a half, and 11, because the organism is so vulnerable at these times. Infections, especially upper respiratory, are common at these ages and often flare up and produce complications. Ear complications need to be watched for especially at the younger ages. I often wonder if these could be avoided if a more protective program to prevent fatigue were instituted. Fatigue is high at these ages. It is hoped that the first grader will spend only a half day in

school. Wednesday off may reduce fatigue by splitting the week in two. Elevens may well profit by some time off when fatigue is high, or at least they should have a midmorning snack to break into their fatigue and give them a metabolic uplift.

Certain complaints of physical discomfort have their developmental significance. A common complaint at three and a half and seven years of age, both "inwardizing" stages, are leg pains. The basis of this complaint is not altogther easy to understand, but the symptoms are frequently relieved with massage. Often we neglect to use so simple a remedy. We recently heard from a parent who reported that she controlled her son's head banging by massaging him each night when he went to bed. Still another complaint at seven is headaches. Seven actually thinks so much that he reports "my thinker hurts." (There can of course be other reasons for the presence of headaches which need to be ruled out.)

A significant differential diagnosis in relation to abdominal pain may be necessary at nine years of age. One is apt to think of an inflamed appendix, but when the abdomen is opened, inflamed mesenteric lymph nodes may alone be found to be the cause of the pain. We who study child development wonder if the very intricacy of the growth process at this age of nine might not be considered as related to the kind of infection that occurs. There is much that still needs to be discovered through further research. Certainly there is a close relationship between certain personality types and their illnesses and somatic complaints. We need to be more aware of these relationships so that we may more effectively protect these individuals, or at least we may handle their illnesses more effectively.

Within the area of rate of growth, we are becoming more and more aware through our research that all too many children are being overplaced in school as indicated by their slower developmental rate of growth. In our present study which we have conducted over the past three years on a group of five-, six-, and seven-year-olds, we are finding that this overplacement can be as high as from 30 to 40 per cent in a given class. In this connection I feel the school nurse is often in a strategic position to help out. If she knows about behavior, she will recognize immaturities when she sees them. A good example might be a five-year-old acting like a four-year-old. If he is still very active in a gross, dashing sort of way either with the stroke of his pencil or running ahead on a walk; if he is still prone to tell tall tales finding it difficult to distinguish between fact and fancy, he is acting like a four-year-old and is not ready for kindergarten.

Similarly at six years if he still likes most to play, wants to help his mommy and cannot return to a task when he has once left it, he is acting more like a five-year-old and should be in kindergarten rather than in first grade.

Another potential means of appraisal is the eruption of teeth. Here we have a unique opportunity to watch a series of changes over quite a period of years. We need to recognize and correlate these findings. Nurses could become more aware and could collect more relevant data. The very name "six-year-old molar" alerts us as to the time these teeth are expected. If these teeth have not arrived at the expected time, we have some very pertinent information that this organism is biologically immature. We would also expect the loss of the lower incisors followed by the upper ones around this same six-year period. Whether the molars or the incisors take the lead may give us some very interesting clues to individuality. Might not the incisor movement suggest more focal behavior and the molars a more peripheral frame of reference?

Another significant finding is the tooth that will not loosen and fall out. Thus a second tooth may be forced to erupt behind the first tooth and only by pulling the first tooth can it be removed. Children with this kind of eruption are more often boys. These boys not only hold onto their teeth but also hold onto the immaturities of their past. These should be respected.

Many factors can and should be considered in deciding about school placement. We lean heavily on a child's response to a developmental examination to tell us where he is functioning. Just the simple copy of the six basic forms of circle, cross, square, triangle, divided rectangle, and diamond can tell us much about the five-year-old before he enters kindergarten. Thus we could separate the less mature fives from the more mature ones. We could provide the younger group with a more active four-year-old program. We might even establish a five and a half-year-old group for the more mature fives to provide a more serious learning program preparatory for first grade. By doing this a child could spend from two to three years in kindergarten without having to repeat.

Age per se should not be neglected in relation to placement. A child cannot grow any faster than he is growing. We would like him to be fully six when he enters first grade or at least six by October 1. We feel that many later problems stem from an age immaturity. It has been the policy of schools all too long to allow children to enter first grade if their birthdays fall before December 31, with some variation in different communities. Fortunately many communities are beginning to combat excessively early entrance. These children who are too young are the unnecessary failures. And these are the children who should rise to the top of their proper class, whereas they often fall to the bottom in the older more mature group to which they do not belong.

I realize I have touched lightly and have perhaps ranged too widely over a number of subjects. My chief hope is that some of the material and ideas I have put forth will have meaning for those concerned with these matters and will start them thinking and observing along new lines.

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This paper was presented at the Western Branch-APHA Annual Meeting, May 26, 1960, in Denver, Colo.

The development of a program to encourage continuous health supervision of school children is described. Experience in community planning, as well as pitfalls and failures are discussed, and the process by which the health department, PTA, medical society, and the schools joined together is presented.

PROGRESS TOWARD CONTINUOUS HEALTH SUPERVISION

Harold H. Mitchell, M.D., F.A.P.H.A., and William J. Peeples, M.D., F.A.P.H.A.

FOR MORE than 40 years the number of children who receive continuous health supervision has been increasing. This trend has had a profound effect upon pediatrics. Its effect upon public health practice has not been so apparent. In 1925, when the Summer Round-Up Campaign of the National Congress of Parents and Teachers was started, such a long-term objective was envisioned. Its immediate objective, however, was to promote health examinations before entrance to school through the mobilization of millions of parents.

In 1956 the National Congress adopted a new program—"a policy supporting and encouraging a program of continuous health supervision of children from birth through their school experience rather than only a program of a single appraisal on school entrance." The new program had the unanimous approval of medical, dental, and public health organizations.

What is the prospect for such a program?[1] Has the new program influenced the unique and successful public health education contribution of the Summer Round-Up Campaign of the National Congress of Parents and Teachers? Is the new objective so broad that local Parent Teacher Associations feel lost in the vast job of public education? What professional help and leadership are schools and health departments offering to the local Parent Teacher Associations? Are the educational, social, medical, public health, and economic forces being coordinated to influence progress toward continuous health supervision?

These questions have been the concern of the Health Department of Montgomery County. It has presented them to the County School Health Council which is representative of the professional and volunteer agencies concerned with the welfare of the school-age child. They have reviewed their experiences, observations, and opinions and made some evaluation in terms of the basic policies of the National Congress of Parents and Teachers.

Basic Policies

The statement of these basic policies was presented by the late Dr. Henry Helmholz in 1956 as follows:

"1. The special contribution to be made by PTAs is 'promotion' of continuous health supervision and 'education' of parents concerning its value. Medical and dental services will of necessity be the responsibility of doctors, dentists and nurses.

"2. There should be close cooperation with established health organizations and agencies in the program's development.

"3. Every effort should be made to further a close relationship to parents and children with their family physicians and dentists."

The greatest difficulty in following these basic policies is in maintaining interest in the step-by-step process without losing sight of the ultimate goal of the education of parents as to their responsibility for their own children.

The Prospect

The prospect has been encouraging in Montgomery County because of the response of parents, physicians, and school staff. The momentum of the PTA Round-Up has not been allowed to lag, even though the single appraisal does not by itself teach the value of health supervision. It prepares the way for physicians to establish confidence in their trustworthiness and interest in the welfare of children. It goes beyond the parents' concern about minor ailments, acute illness, and injury. A single visit of the well child to the physician may be a first step toward continuous health supervision. A close relationship of parents and children with the physician of their choice may be made possible through this visit.

The physician can be most effective in education as to the value of health supervision. This has already been demonstrated by the way pediatricians have increased the preventive part of their practice. This has come with the advance of medical education in the fields of child development and health supervision. It will be further advanced by physicians themselves as they learn to meet the competition of their colleagues for high-quality health supervision, early care, and medical guidance (especially if this is demanded by the general public).

Promotion and education concerning the value of health supervision is not too broad an objective for the PTA when they share in community planning. They accept the objective of progress toward more health supervision. They recognize such progress will be the resultant of many educational, social, medical, public health, and economic factors. The big job is to help coordinate these forces through organized community efforts.

Early Experiences and Observations

The Summer Round-Up Campaign developed considerable interest throughout the country before the depression of the early 30's. To get it started many physicians gave generously of their time as volunteers. During the early 30's the PTA leadership grew rapidly and the trend changed toward employing physicians for the service. During this period the danger of overloading the physician gained widespread recognition. Emphasis upon quantity rather than quality gave a false sense of security. This early experience showed how easy it is to lose sight of our goal and to aim at large numbers of examinations rather than education as to the value of the service.

Later, there was a swing toward improving the quality of the examinations. Twelve years ago in Montgomery County, the health department employed physicians to examine and immunize the children by appointment. Parents were present and there was privacy in the examining room. But even with reasonably worthy examples of health examinations, we were contributing nothing "to further a close relationship to parents and children with their family physician. . . ."

PTA Cooperation

PTA leaders have invariably had such a close relationship with their own physicians that they appreciated the value of health supervision and were ready to cooperate on plans to promote the value

of the service. They did not favor having such services made available in the schools.

Policy Decisions

This kind of leadership in the PTA does not arise without considerable community planning. The change from the round-up at school or health department expense to an emphasis upon private physician examination has been a gradual process. Our public health philosophy gave early recognition to the soundness of the concept that parents are primarily responsible for their own children. The health department's responsibility is for community health education and to supplement services that are not available to all the people. However, the health department's responsibility is a coordinating function[2] in meeting needs that people do not or cannot provide for themselves. We recognized how many parents preferred their own physician for health advice and immunization. More health examinations were clearly indicated, but if all the examinations were to be done at the expense of the health department, this expense would jeopardize the development of other needed health department services.

The Idea Evolves

In the early stages of the transition from examinations at school to education for private physician examinations, there was considerable concern among some principals and some nurses about the children who rarely see a physician. They recognized that persistent follow-up would be necessary with some parents, and that a few would face real hardship in paying their physicians. This was an appropriate concern, and the importance of reaching all children with examinations and immunizations raised questions about making this health service available at government expense. However, the PTA leaders were influential in creating enthusiasm for private physician service because of the quality of pediatric health supervision they had had for their own children.

As soon as principals and public health nurses were aware of the early demonstrations of promotion and education of parents for private office examinations, the program moved forward. They discovered, too, that the immunization and examination of children who could not afford private service could be provided with no loss of dignity nor onus of charity medicine.

One important contributory factor was the quick recognition of school personnel that five-year-olds were less likely to develop school phobia if they did not associate their first visit to school with a "shot in the arm." When it was observed how often ordinarily well behaved five-year-olds had a tantrum as they received an injection, the point was made.[3,4]

Education for immunization has generally been more effective than education for health examinations. Immunization has won widespread support while health examinations have had little appeal. On the other hand, the pediatricians who do an effective job of continuous health supervision during infancy and the preschool period have little difficulty in maintaining this relationship throughout childhood and, more recently, into adolescence. For children who have not had continuous health supervision, school entrance has been the time when children were checked for immunization status. The booster dose was most often a reason for the child to return to the private physician for both immunization and health examination. This helped to turn the tide when parents learned that immunization was not to be given in school.

Like some principals, some public health nurses have found it difficult to give up the examinations and immuniza-

tions in school. It somehow seemed easier to give the service in school than to persuade parents who are doubtful about arranging for private service. The realization of the seriousness of the problems of the family without a physician has given a new role to the public health nurse—that of persuading every family to select a private physician. The public health nurse has become convinced that her function should include education to have the examination done and "to further a close relationship to parents and children with their family physician and dentist." It has been encouraging to note how effective the nurse can be in this educational function, in spite of her tendency to become preoccupied with the problems of low-income families.

Medical Society

The next step in the gradual process of cooperative decisions toward continuous health supervision was agreement with the medical profession so that physicians might play their obviously important role in this community project. Discussions with the medical society led to agreement that private physicians should carry out immunization on all children prior to school entrance in so far as parents accepted the responsibility for their own children. The great influx of young pediatricians to Montgomery County since World War II has naturally set a high standard for continuous health supervision. The extension of this service into the school period has established the health examination for well children as the role of the private physician. Discussions with the medical society made clear the duty of the health department, the PTA, and the schools to educate everyone in the need for a personal or family physician. These educational efforts have also helped private physicians to develop greater interest in and responsibility for health examinations.

For children whose parents are unable to pay for private care or who go to their private physician only for illness, the child health clinics of the health department have become an acceptable resource. This acceptance of the child health clinics improved when the importance of persuading every family to choose a physician was clarified fully as a fundamental policy of the health department. Then the admission to child health conferences was largely based upon referrals from the family physician or pediatrician. Children in all indigent and medically indigent families (those eligible for Maryland Medical Care Plan) are referred for the follow-up of immunization and health supervision to child health clinics. With this policy the child health clinics have grown with the population but, of course, the policy has also been facilitated by the relatively high economic status of the population.

These discussions, and the development of policies have aided rapport between the health department and the medical profession. Immunization and health supervision of children have become a truly cooperative enterprise between private physicians and the health department. By the time children enter school, if they have not yet been immunized and have not established a close relationship for health supervision with their family physician or pediatrician, it is agreed that either the educational program has failed, the private physician contacts have not been educationally effective, or there is an inability to pay for private service.

During the first year of school the public health nurse carries a responsibility for education and follow-up of those parents who have not yet obtained a health examination for their child or completed their immunization. This follow-up provides for an individual decision for private health supervision or clinic service.

Mass Media

While the emphasis has still been on a single appraisal on school entrance and on the completion of immunization, the widespread community interest in the PTA has made publicity for health supervision readily acceptable. All agencies have cooperated with the distribution of literature, news releases, radio and one television program. These offered mass media channels for emphasis upon continuous health supervision and the personal physician.

Choosing a Physician

Another essential step on the way toward continuous health supervision is to help people in the selection of a physician. Many young parents moving to new suburban communities are not only unprepared for medical emergencies but uninformed on how to choose a physician. This was recognized as a public health problem, and the Health Department took it to the Medical Society. The development of a Medical Bureau by the Medical Society, and an increase of private office examinations for the PTA Round-Up led to an educational program for a personal or family physician which became a cooperative community project. When a leaflet, "Your Personal Physician—Why?," was developed cooperatively, the Medical Society voted to pay for a large printing. All parents registering a child at the spring round-up were interviewed by a public health nurse and urged to call the Medical Bureau if they did not already have their own physician. The Medical Society revised the leaflet after some study and arranged for its distribution by the "Welcome Wagon," a service sponsored by local merchants for all new families moving into the community.

All these steps provide a channel for education concerning continuous health supervision.

School Support

The enthusiasm and support of school personnel has also grown in a step-by-step process. When the Summer Round-Up was started in this county it was a device to get coverage for health examinations and immunization. This was generally regarded as a PTA and Health Department job. The schools always cooperated but did not carry a major responsibility.

The tide turned so that the Board of Education fully accepted a cooperatively planned Preschool Conference Program after the planning and policy discussions of the School Health Council had led to a recognition that the child and parent received important preparation for entrance to kindergarten.

The health officer and superintendent of schools agreed to divide the load of revision, printing, distribution of forms, educational materials, and manuals of directions. Scheduling and recommendations are also shared by agreement. The PTAs are as important as ever but are relieved of excessive administrative burdens.

Many schools close their kindergartens on Preschool Conference day during April or May so as to release the teacher to get acquainted with the new children and parents. Children and parents come by appointment to allow time for conferences and to avoid crowding and waiting. A few regular kindergarten children are invited on Preschool Conference day to provide a happy atmosphere to which the preschool child is introduced.

The Maryland Cumulative Records have in the past required a heavy chore for teachers and nurses to transcribe identifying information on the record forms. The preplanning of each principal, PTA health chairman, and public health nurse has made it possible to have volunteer help for interviewing parents and reviewing medical and social history

Table 1—Distribution of Schools According to Per cent of Children Examined

Range of Per cent of Children Examined	1957 Schools	1957 Number of Kindergarten Children Enrolled	1957 Per cent Examined of Total Kindergarten Enrollment	1958 Schools	1958 Number of Kindergarten Children Enrolled	1958 Per cent Examined of Total Kindergarten Enrollment	1959 Schools	1959 Number of Kindergarten Children Enrolled	1959 Per cent Examined of Total Kindergarten Enrollment
100-96	24	2,362	32.5	40	3,747	48.6	26	2,481	30.4
95-91	28	2,374	32.7	23	2,265	29.3	33	3,454	42.4
100-91		4,736	65.2		6,012	77.9		5,935	72.8
90-86	13	1,221	16.7	11	744	9.7	18	1,383	17.0
85-81	4	332	4.6	8	726	9.3	6	666	8.3
80 and under	12	980	13.5	4	240	3.1	3	156	1.9
Total	81*	7,269	100	86*	7,722	100	86*	8,140	100

* Reports not received from all schools.

sheets. This means that registration is completed with all identification and history data recorded. Significant confidential information is provided for by parent-child-nurse conferences after identification and routine history has been recorded. This requires scheduling the Preschool Conference days so that extra public health nurses are available for private interviews. The nurse arranges for a further conference with the parents when indicated.

The few children who register in September, because they did not attend the Preschool Conference in the spring, have generally been a follow-up burden upon the public health nurse, because she has been unable to be present at the September registration. The extended responsibility of the school personnel for the program now insures understanding and help from the principal and kindergarten teacher for the September registrants.

Evaluation

As the program progresses we anticipate that the evaluation of several other community aspects will be indicated. At this stage we are concerned with whether we can improve the proportion of children examined, immunized, and tested with tuberculin. A report has been made to each school each year during the last seven years so that each school may know how well it is doing. We call this the Preschool Conference. It is summarized in Tables 1, 2, 3, 4, and 5.

For the last three years we have set a deadline in October for a report of the total number of kindergarten children examined in the spring and subsequently. These reports showed in 1957 the average of the percentages of the children examined in each school was 91 per cent and the median school was 92.5 per cent. In 1958 the average percentage was 93 per cent and the median school was 95 per cent. In 1959 the average percentage was 92 per cent and the median was 93 per cent.

Neither median nor average gives us a clue as to whether we may improve our record without an extravagant expenditure of study, time, and effort. However, a study of the full distribution of schools according to the percentage of children

examined reveals many schools with a good record. At least we should be able to improve the situation in the few schools with 80 per cent and less examined. Actually such improvement occurred in 1958 and 1959 (Table 1).

At the upper end of the scale there were 15 schools with 100 per cent of the children examined in 1958. Both 1958 and 1959 had five schools with 100 per cent. Moreover, there were many schools with 96 per cent or better. Thus far it seems that an achievement better than the median for 1958 (95 per cent) may be close to the point of diminishing returns. It seems reasonable that any variation between 96 per cent and 100 per cent may be due to chance factors.

Table 1 shows the distribution grouped into five categories with 100 per cent to 96 per cent of the children examined in the top group and 80 per cent or under in the lowest group. We conclude that the trend is slightly favorable but there are indications that continued vigilance in promotion may yield results in improvement. As only a few schools have a consistently high percentage of children examined, we feel that this kind of annual evaluation is worth while.

The response to the Preschool Conference in the spring has improved gradually, so that today we expect a high proportion of children to come with their examinations already performed by their own physician. The influx of new families each year keeps everyone on their toes to inform new families so that they know what is expected. Table 2 shows the record of children who were examined prior to the conference each spring for the last seven years.

The cooperative efforts of the medical profession, the PTAs and the school staff on the Preschool Conference Program have made it relatively easy for the Health Department to meet their responsibility for knowing how well the community is maintaining a satisfactory level of immunization (Tables 3 and 4). DPT and smallpox vaccine were available to private physicians without cost until 1956, so that most children received the combined DPT. Apparently there was no effect on the level of immunization of the children resulting from the change in 1956 to stop the free supply of vaccine and DPT to private physicians.

The policy of promoting tuberculin testing was not started until about 1953. The comparison of Table 4 with Table

Table 2—Children Who Came to Preschool Conference with Medical Examination Completed

	1953	1954	1955	1956	1957	1958	1959
Number of schools reporting	66	76	80	81	86	87	92
Number of children enrolled	4,285	4,373	4,881	5,624	6,161	6,416	6,745
Percentage of enrolled children who had been examined	73.5	75.9	82.1	76.8	76.3	83.4	81.7
Percentage examined by private M.D.	72.2	73.2	79.4	74.4	73.4	81.2	79.4
Percentage examined by clinics	1.3	2.7	2.7	2.4	2.9	2.2	2.3

Table 3—Immunization Status of Children When They Enrolled at Preschool Conference

	1953	1954	1955	1956	1957	1958	1959
Percentage of enrolled children vaccinated	89.0	92.7	94.8	85.8	86.1	93.9	92.5
DPT (first course)	91.6	93.9	97.3	88.1	87.7	96.3	93.6
DPT booster	71.2	72.4	76.5	71.0	72.7	83.2	85.1
2 polio shots				45.8	79.8	93.2	
3 polio shots				2.3	68.6	88.0	88.5
4 polio shots							51.9

Table 4—Tuberculin Test (PPD and Patch Tests) Status of Children When They Enrolled at Preschool Conference

	1953	1954	1955	1956	1957	1958	1959
Percentage of enrolled children who had tuberculin tests	24.6	62.5	72.2	67.6	68.3	75.3	74.3
Who were positive	1.9	1.8	1.6	1.7	1.4	1.5	1.2
Who were negative	67.6	96.8	92.9	91.1	92.2	92.4	93.8
Tested — no results available	30.5	1.4	5.5	7.2	6.4	6.1	5.0

Table 5—Children Who Came to Preschool Conference with Dental Examination Completed

	1953	1954	1955	1956	1957	1958	1959
Percentage of enrolled children who had dental examination	5.7	24.5	46.3	42.2	45.3	53.4	52.4

2 indicates the lag of tuberculin testing as compared with the examination acceptance. This delay in the acceptance of the tuberculin test has led to an agreement with the Medical Society last year that the children who have not been tested when examined would be offered the tuberculin test in a mass approach in school.

Dental examinations shown in Table 5 are another part of the program which has not progressed satisfactorily even among families who are well able to pay for such care.

Summary

1. The Summer Round-Up of the National Congress of Parents and Teachers has made an unique contribution toward education as to the value of medical examinations for well children. Their new program to support and encourage continuous health supervision is regarded as

a challenge to health departments and schools.

2. Observations of pitfalls and failures are discussed as well as experience with community planning which suggest possibilities for promotion of continuous health supervision.

3. Steps are described in the process of gaining team work participation of the PTA, the health department, the schools, and the medical society as essential for such public education.

4. The progress made over a seven-year period has been shown.

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Dr. Mitchell (retired) was administrator of school health services, and Dr. Peeples is health officer, Department of Public Health, Montgomery County, Rockville, Md.

Further Need Abroad for Back Issues of Journal

The University of Hue in the free Republic of Vietnam opened its doors in 1957 and has since then nearly doubled its enrollment—to 1,192. In the fall of 1960 the university opened a school of medicine with emphasis on public health.

The American Friends of Vietnam have undertaken to obtain for the medical school certain books, professional journals, and other resource materials, based on needs indicated to them by the medical staff of the Hue City Hospital (which is being used by the university for its training program). Among the publications which the university has requested is the American Journal of Public Health. Journal readers who wish to dispose of back copies of the Journal in this worth-while manner should send them to the office of the AFV where each will be catalogued and prepared for shipment to Vietnam. Gifts to the AFV—including gifts of this nature—are deductible from taxable income, the organization reports. Each donor will receive a formal receipt acknowledging the value of the contribution. The American Friends of Vietnam, 4 West 40th St., New York 18, N. Y.

This survey of parasitic infestation among migrant workers from the British West Indies is placed in the context of the larger problem of parasitism among migratory agricultural workers. The authors discuss the potential hazards of this problem and future needs for research and application.

PROTOZOAN AND HELMINTHIC INFESTATIONS AMONG MIGRATORY AGRICULTURAL WORKERS

RESULTS OF A SURVEY AMONG BRITISH WEST INDIAN AGRICULTURAL WORKERS

Henry Beye, M.D.; Charles Brooks, M.D.; and Elizabeth Guinn

DURING November, 1958, stool specimens from 140 and blood specimens from 470 British West Indian agricultural laborers in the Clewiston, Fla., area were collected and examined* for intestinal and blood parasites.

These observations were made primarily to assist in the programing of our own clinical research projects, but it is believed that the data may be of interest to public health or tropical disease workers, and to those whose special health interests are related in some way to the migratory agricultural worker.

Methods

The 140 stool specimens were collected from every third, fourth, or fifth man on the camp roster, depending upon the size of the camp. Marked containers were left with the camp foreman in the evening and collected the following morning. The single specimen was examined that morning by the zinc sulfate concentration method of Faust and coworkers.[1] All identifications of Entamoeba histolytica were verified by at least two examiners. Thus, the findings are based on observation of one, naturally passed stool per person examined by a concentration technic. No effort was made to search for organisms in simple saline or iodine-stained smears.

Blood collections were made between 8:30 p. m. and 11 p. m. Approximately 8 ml of venous blood were obtained. One ml was put immediately into a centrifuge tube containing 9 ml of 2 per cent formalin for subsequent search of microfilariae following Knott's technic,[2] four thick smears were prepared; the remainder of the blood was placed in a test tube for separation of the serum. Thick smears were stained with Giemsa and at least 50 oil immersion fields were examined. The sediments in the centrifuge tubes were examined microscopically in wet smears for microfilariae.

* This study was made in cooperation with the British West Indies Labour Organization and the United States Sugar Corporation.

Table 1—Frequency Distribution of Parasitologic Findings, 140 Stool Specimens, British West Indian Agricultural Laborers, November, 1959*

Results of Examination	No.	Per cent
Multiple parasites	92	65.5
Negative	20	14.3
Single species	29	20.2
Hookworm	76	54.3
Endolimax nana	60	42.9
Trichuris trichiura	47	33.8
Entamoeba coli	36	25.8
Iodamoeba butschlii	9	16.4
Giardia lamblia	15	13.8
Entamoeba histolytica	17	12.0
Strongyloides stercoralis	16	11.4
Ascaris lumbricoides	6	4.3

* Permanent residence given as follows:

Jamaica	84	St. Kitts	9
British Guiana	17	Stanleytown	2
Barbados	12	St. Elizabeth	1
Antigua	3	West Bank	1
St. Thomas	3	Unknown	8

Results

A. Intestinal Parasitism—The workers ranged in age from 21 to 48 years. As seen in Table 1, 84 were from Jamaica, and the remaining 56 from eight other islands in the British West Indies and British Guiana. Table 1 shows the number found positive and the type of parasites observed in the stools. It may be noted that hookworm was the most prevalent parasite, being found in 54.3 per cent of the men. The percentages for other intestinal parasites in terms of frequency were: Endolimax nana 42.9 per cent, Trichuris trichiura 33.8 per cent, Entamoeba coli 25.8 per cent, Giardia lamblia 13.8 per cent, Entamoeba histolytica 12.0 per cent, Strongyloides 11.4 per cent, Iodamoeba butschlii 6.4 per cent, and Ascaris lumbricoides 4.3 per cent.

Inasmuch as some of these workers were recent arrivals to the United States, while others had worked in this country for as long as two years, a comparison of the rates of infection by length of stay in the United States seemed of interest. Table 2 includes infection rates for hookworm, and for multiple parasites, among the group which came to the United States during 1958, and the group arriving either in 1956 or 1957.

The hookworm infection rate among those workers in the United States longer than one year is lower by twice the standard error of the difference. Many biological or technical factors may be reflected in this difference between 68.2 per cent and 41.4 per cent. These include a decrease in transmission of the parasite; termination of infection while the workers are in the United States, either spontaneously or by treatment; and, of course, the correctness of the assumptions (1) that parasitism was as high or higher on arrival among the workers who came to the United States more than one year ago, and (2) that the two groups lived in the same environment.

B. Malaria and Filariasis—Blood specimens of four of the workers revealed microfilariae of Wuchereria bancrofti. One of these, a worker from St. Kitts, was also infected with Mansonella ozzardi. Two of the infected workers were among the 113 Barbadians examined, one from three workers from Antigua, and the remaining one from ten workers examined from St. Kitts.

None of the 311 workers from Jamaica, the 29 from British Guiana, or the four from Montserrat or Leeward Islands was found to be infected with malarial or filarial parasites. No malaria organisms were found in any of the thick blood smears collected from the 470 workers.

Discussion

These findings are of interest from two aspects: (A) parasitism among migratory agricultural workers, and (B) filariasis in the Caribbean area.

A. Parasitism Among Migratory Agri-

Table 2—Number and Per cent of British West Indian Agricultural Workers with Hookworm or Multiple Intestinal Parasites

Stay in the United States	No. Examined	No. with Hookworm	Per cent with Hookworm	No. with Multiple Intestinal Parasites	Per cent with Multiple Intestinal Parasites
Greater than one year	70	29	41.4	46	65.7
Less than one year	66	45	68.2	43	65.4
Total	136*	74	54.4	89	65.5

* Length of residence unknown in 4.

Calculation of the standard error of the difference in the per cent of the two groups infected with hookworm.

$$\text{Diff.} = \overline{pq\left(\frac{1}{N_1} + 1/N_2\right)}$$

$p = 0.544$
$q = 0.456$
$N_1 = 70$
$N_2 = 66$

$$= \overline{(0.544)\ (0.456)\ (1/70 + 1/66)}$$

$$= \overline{0.248\ (0.013 + 0.0151)}$$

$$= \overline{(0.248)\ (0294)}$$

$$= \overline{0.00719} = 0.084 = 8.4\%$$

Act. Diff. $= 62.2 - 41.4 = 16.8\% = 2X$ S. error.

cultural Workers—Approximately 3,000 agricultural workers come to the United States annually under the sponsorship of the British West Indian Labour Organization. The group comprises a small segment of the total agricultural migrant labor force, estimated at 1.25 million persons in 1956.[3] Four hundred and fifty thousand of the persons were from outside the United States, the remainder being domestic migratory agricultural workers or their dependents. Foreign workers were from a number of areas, Mexico contributing 450,162 in 1957,[4] but smaller sources include the British West Indies, Canada, and Japan. During the fiscal year 1955-1956, the Migration Division of the Department of Labor, Commonwealth of Puerto Rico, through its field offices in the United States, served approximately 30,000 agricultural workers from Puerto Rico, 17,700 of whom came to the United States by a work agreement arranged through the U. S. Employment Service.[5]

According to Axelrod,[6] there are 56 major areas in the United States requiring agricultural migratory labor. These areas are located in 44 of the 48 continental states and involve about 1,000 of the 3,070 counties in the United States. Nearly 900 counties have 100 or more domestic migrants at the peak of the season,[3] distributed as seen in Figure 1. However, only 98 counties have more than 3,000,[7] 22 of these 98 counties, however, have more than 10,000 migrants at the peak. Petry and Johnston write[8] that these workers comprise about 7 per cent of the total farm labor force

and are employed by 3 per cent of the farms. This migratory labor force is obviously large in number and operates in a large proportion of the rural areas of the United States.

A consideration of health hazards associated with such a large and complicated phenomenon as this migration must be based on epidemiologic and endemiologic information concerning a large number of disease producing agents. Unfortunately, this type of information is largely unobtainable, and as stated by Anderson,[7] "the exact dimensions of the problem are poorly defined." In no area is this more true than in the protozoan and helminthic diseases. The review of parasitism among agricultural migrants shall be pursued in efforts to obtain information on the following questions:

(a) What is the parasite (protozoa and helminths) reservoir among agricultural migrants?

(b) Are the migrants importing species of parasites new to the present United States population?

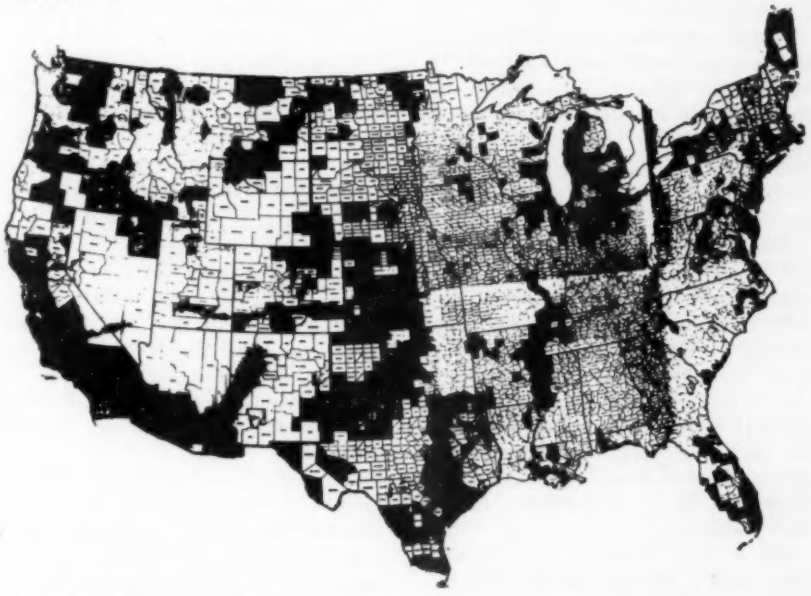
(c) Are there any actual or potential health hazards associated with the findings in a or b?

(d) Are there instances of transmission from the migrant to the resident population and vice versa?

(a) The Parasite Reservoir—Direct information on this subject is very meager and one must often use supplemental information obtained in the country of origin of the agricultural migrants.

The report of the Migrant Health Project of the Lower Snake River, Idaho,[9] contains direct information of the prevalence of protozoa and helminth infections among agricultural migrants.

Figure 1—Nearly 900 Counties Have 100 or More Domestic Migrants at the Peak of the Season



Shading indicates counties having 100 or more migrants at the peak of the crop season. Dark counties have more than 3,000; medium, from 500 to 3,000; and light, from 100 to 500.

Table 3—Amebiasis Surveys Among Rural Population—Southeastern States

Place	Author	No. Examined	No. Positive	Per cent Positive	Date
Georgia	Seckinger	322	66	20.5	1936
Fayette County, Tenn.	Eyles	2,657	278	10.5	1953
Yazoo Delta, Miss.	Jones, et al.	935	100	10.7	1953
New Hope, Tenn.	Jones, et al.	322	72	22.4	1954

Four hundred and eighty-four single stool specimens were examined from Spanish speaking children under 15 years of age. Among these, 206, or 42.6 per cent, revealed intestinal parasites. The percentages for pathogenic intestinal parasites among the group were as follows: Hymenolepis nana 15.5 per cent, Giardia lamblia 8.1 per cent, Entamoeba histolytica 1 per cent, Necator americanis, Trichuris trichiura, Enterobius vermicularis, and Taenia saginata, each 2, or 0.4 per cent.

In the same report, unpublished data of a migrant health study conducted at Ft. Lupton, Colo., in 1954, are given. In this study the stools in five of 14 Spanish speaking hospitalized agricultural workers were positive for E. histolytica, and three or 22 per cent were positive for helminths.

During the Snake River survey of 3,303 agricultural migrants, two cases of malaria were reported to be parasitologically diagnosed. Supplementary information in Fresno County, Calif., by Watt[10] and co-workers revealed 6.1 per cent of rectal swab cultures in children living in migratory camps to be positive for the genus Shigella, while 0.4 per cent of rectal swab cultures from a group of children living in a housing project were positive for the same genus.

Myers, et al.,[11] report the results of stool studies of 56 preschool Puerto Rican children born in Puerto Rico but living in Philadelphia as follows: E. histolytica 3.6 per cent, hookworm 7.1 per cent, A. lumbricoides 14.3 per cent, E. coli 10.7 per cent, T. trichiura 53.6 per cent, G. lamblia 35.7 per cent, E. nana 1.8 per cent, Chilomastix mesnili 1.8 per cent. It is of interest that the prevalence of intestinal parasites in 100 Puerto Ricans born in the United States was considerably less. No schistosoma ova were found in this group of young Puerto Ricans. On the other hand, the prevalence of Schistosoma mansoni in certain rural areas of Puerto Rico still is as high as 20 per cent.[12]

In consideration of the contribution of the domestic migratory agricultural workers to the parasitic reservoir, information summarized by Wright[13] is helpful. Prevalence figures for nine southeastern states including both urban and rural areas in 1953-1954 were as follows: A. lumbricoides: range—Alabama 0.4 per cent, Kentucky 21.1 per cent; T. trichiura: range—Alabama 0.03 per cent, Louisiana 4.3 per cent; hookworm: range—Tennessee 2.0 per cent, Florida 18.9 per cent. Surveys for amebiasis among the rural population in the southeastern states are listed in Table 3.

Although the above results are not comparable to each other, or to our observations among the British West Indians, there would be general agreement that the parasite reservoir of the domestic and foreign agricultural migrants is large. Whether or not this

reservoir constitutes potential health hazards will be discussed below.

(b) Importation of Species of Parasites New to the United States Resident Population—The Snake River report lists the diagnosis of two cases of malaria; we found four British West Indians infected with W. bancrofti, of whom one was also infected with M. ozzardi; and the importation of S. mansoni with the Puerto Rican population is well documented. The list of potential protozoan, helminthic, bacterial, and virus infectious agents could be made large—including such possibilities as Chagas' disease and yellow fever.

(c) Actual or Potential Health Hazards—The actual or potential health hazards associated with the parasite reservoir among agricultural migratory workers has both a quantitative and qualitative aspect. In terms of numbers of intestinal parasites, we should know if these workers are bringing in an excess of the same types of parasites already prevalent to some degree among the resident population. In terms of species of parasites, it is important to know whether parasites relatively new to the resident population are in the migrant population. The resident population at risk comprise (1) those closely associated with the labor camp areas, and (2) the larger consumer population potentially at risk because of a possible breakdown in sanitary control in some process especially vulnerable to the effects of contamination, such as water or food processing.

Suggestive evidence of the parasite reservoir among residents of some of the states in which agricultural migrants work is seen in the results of surveys for the incidence of E. histolytica. This survey has been summarized by Anderson, et al.[14] Selected information from Anderson's summary is included in Table 4.

The range in the per cent of infection is from 0.8 per cent to 11.1 per cent, and although of approximately the same magnitude as that found in the Snake River project and by Myers for the same protozoan, the percentage figures are less than those summarized among rural residents in the southeastern United States by Wright, or found among the British West Indians by the authors. There would probably be general agreement that the parasite reservoir of the residents is less than that of the agricultural migrants and, therefore, the migrations may increase the potentiality for the transmission of protozoan and helminthic parasites.

A most important consideration in evaluating the potential hazard of these protozoa and helminths is the endemiologic characteristics of each of these parasites.

Hookworm, for example, although present in 54.3 per cent of the British West Indian agricultural workers, is generally not able to effectively complete its life cycle north of the 36 parallel, a line that is approximately the northern boundary of North Carolina, Tennessee, Arkansas, and Oklahoma.[15]

E. histolytica cysts although sensitive to drying have been instrumental in serious water-borne epidemics, and may also be transmitted through personal contact or by flies and food contamination.

Other intestinal parasites such as T. trichiura, G. lamblia, and A. lumbricoides have their individual endemiologic pattern, but their prevalence is generally associated with sanitation and food habits.

Filariasis—The finding of four infected individuals with W. bancrofti, one of which was also infected with M. ozzardi, raises additional questions concerning possible health hazards. W. bancrofti was once prevalent around Charleston, S. C.,[16] presumably brought from Africa by the slave "migration." The most universal mosquito vector, Culex quinquefasciatus, is prevalent in

Table 4—Representative Surveys for Prevalence of Entamoeba histolytica in Certain States Using Agricultural Migratory Laborers

Area	No. Examined	Per cent Prevalence	Subjects	Observer	Year
California	2,016	3.3	Hospital patients, kitchen employees, children in institutions	Kessel and Sinitsin	1938
Illinois	408	3.18	Infants and children in hospital	Howell and Knoll	1941
	105	4.8	Orphanage inmates	Howell and Knoll	1941
	2,024	1	Clinic patients	Rodaniche and Palmer	1942
	667	2.4	Food handlers	Rodaniche and Palmer	1942
	1,999	7.9	Hospital patients and employees	Hood	1943
	265	1.8	Food handlers	Hood	1943
Indiana	258	0.8	Hospital patients	Headlee	1942
Maryland	1,015	13.6	Feebleminded students	Armaghan and Mediary	1938
New York	5,575	3.9	Employees and inmates—hospital for insane	Birnkrant, Greenberg, and Most	1945
	1,822	6.8	Well persons	Birnkrant, Greenberg, and Most	1945
Pennsylvania	190	11.1	Food handlers	Wenrich and Arnett	1942
	306	3.6	Hospital employees	Rothman and Laskey	1943

many parts of the United States. The establishment of new foci in the United States, however, would probably take a number of years to become manifest. It is questionable that under present standards of sanitation and mosquito control in the United States that the disease would become apparent. Nevertheless, the potentialities exist.

Schistosomiasis—S. mansoni among the Puerto Ricans and other migratory workers from endemic areas pose special potential hazards. Suitable vector snails have been reported from Louisiana by Cram, et al.[17] Since no universally effective method of control, or even of treatment, of this important world disease has yet been found, public health workers should be aware of its serious potentialities as a future health hazard.

Malaria—The finding of two cases of malaria among the 3,303 Spanish speaking nationals in the Snake River survey, and of seven cases in California discussed by Dunn and Brody,[18] indicates the potential hazard of this well known

parasite which was widely prevalent in the United States in the early part of the 20th century. Suitable mosquito vectors are still prevalent in some parts of the United States.

Although this discussion has concerned itself with a few protozoan and helminthic infections, other protozoa, virus, and bacteria present their special potentialities toward transmission of infection and the production of disease.

The possible hazard associated with frozen foods, picked and processed by infected individuals, has not been studied for intestinal protozoa and helminths, although a considerable literature exists concerning bacteria (Goresline[19] and Ross[20]). For example, Ross performed bacteriological examinations of 117 specimens of precooked frozen foods purchased from retail outlets. Certain specimens were shown to contain "E. coli, coagulase positive staphylococci, and enterococci in large numbers. Members of the Bethesda-Ballerup and Providence groups of paracolon organisms were found." The practice of packing iced vegetables in the field for immediate shipment throughout the United States may present one method of dissemination.

(d) Instances of Transmission of Protozoa and Helminths from Agricultural Migratory Worker to Resident Population or Vice Versa—The authors could find no documented report in the literature of any sizable epidemic or increase in prevalence among a resident population traceable to agricultural migratory workers. The Snake River project report includes an instance of gonorrhea being spread from migratory workers to residents and vice versa, and there are a few reports of diphtheria, salmonellosis, shigellosis, and one suspect case of smallpox among agricultural migratory workers.[1] Dunn and Brody[18] in a review of malaria surveillance in the United States, 1956-1957, document three cases of primary indigenous malaria in Sacramento County in 1956, possibly associated with the importation of the parasite by Mexican agricultural workers in the immediate area. There were between 4,000 and 5,000 Mexican agricultural workers in the immediate area, and at least two were reported by local physicians to have had malaria while in the county, although these cases were not confirmed by health authorities. Studies revealed that Anopheles freeborni were present in moderate numbers. The same authors discuss four cases, three confirmed as vivax malaria in Sutter County, Calif. Three were neighbors on a ranch. A. freeborni were present. A farm labor camp for Mexican nationals was located about a quarter of a mile from the ranch where the cases occurred, but it was not demonstrated that anyone in the camp was the source of the infection. The situation with disease agents whose disease manifestations are more chronic, however, is different from those that manifest themselves through epidemics. The fact that there are no reports for these conditions does not mean that increased transmission is not occurring. It could reasonably reflect that few are looking for signs of infection, and the disease is not yet manifest.

Screening of the Mexican nationals for gross signs of disease, serological tests for venereal disease, and chest x-ray for tuberculosis have been routine for the past few years. The fact that the national health agencies in Mexico and the United States in 1956 developed an international control program for venereal diseases,[21] and utilized this population movement of agricultural workers to the mutual benefit of both Mexico and the United States, is of interest. Such a project could well point the way toward epidemiologic study and possible control of other diseases. Among groups going to the United States where transmission of certain protozoa and helminths is unlikely, such cooperative arrangements may be adaptable for

studies involving mass therapy. The important factor of reinfection, so common in many areas, would be negligible.

B. Filariasis in the Caribbean Area—Although filariasis has been known to be prevalent in the Caribbean area for many years, there is surprisingly little information available in the literature in respect to its prevalence in the islands of St. Kitts, Antigua, and the Barbados. According to Floch,[22] Low found 32.8 per cent of a group in St. Kitts to be infected. In the Colonial Medical Reports,[23] filariasis was said to be a considerable cause of morbidity in Antigua and, in fact, M. ozzardi was first described by Manson in St. Vincents, one of the islands of this group. Platzer and Lawlor,[24] in a report on filariasis in West Indian laborers employed by the Navy in Trinidad, reported 199 persons out of 33,970 with microfilariae. The microfilariae were said to be both sheathed and unsheathed. Our survey of 470 workers merely indicates that the infection is still present on three islands, and absent from a fairly good sample consisting of 311 workers from Jamaica, and the small sample of 29 workers from British Guiana.

Summary

1. A stool survey of 140 British West Indies agricultural workers in Clewiston, Fla., revealed the following prevalence rates for intestinal parasites: hookworm 54.3 per cent, E. nana 42.9 per cent, T. trichiura 33.8 per cent, E. coli 25.8 per cent, G. lamblia 13.8 per cent, E. histolytica 12.0 per cent, Strongyloides 10.4 per cent, I. butschlii 6.4 per cent, and A. lumbricoides 4.9 per cent.

2. Examination of 470 British West Indies agricultural workers revealed microfilariae of W. bancrofti in four individuals. One of these individuals was also infected with M. ozzardi.

3. These findings were reviewed in terms of (A) parasitism among migratory agricultural workers, and (B) filariasis in the Caribbean area.

Migratory agricultural workers number 1.25 million individuals, approximately one-half nationals from outside the United States and one-half workers from the southern states. A population of this size may present public health hazards with respect to protozoan and helminthic infestations and diseases. The review of this subject attempted to gain information on the following questions: (a) What is the parasite reservoir among agricultural migrants? (b) Are migrants importing species of parasites new to the present U. S. population? (c) Are there actual or potential health hazards? (d) Are there instances of transmission from the migrant to the resident population and vice versa?

Direct information on parasitism among the migratory agricultural workers is so meager, while indirect information on this subject among national or United States resident groups is so diverse, that clear answers could not be obtained to these questions. There is evidence of a considerable degree of intestinal parasitism among the migratory agricultural workers, and there is probably general agreement that quantitatively the parasite reservoir is greater than among the United States resident population. There is documentation of the importation of S. mansoni, filarial infections, and probably malaria.

The possible transmission of parasites by citizens born in the United States—domestic migrants—who travel from southern Florida, the Texas border, and the southwest to the northern states each crop season should not be overlooked.

Workers in this area believe that the possibilities of contact between the domestic migrant and the local resident are actually greater than between the foreign worker and the local resident.

The health implications must be considered in terms of the epidemiologic

characteristics of each parasite and as these apply to (1) individuals and communities closely associated with labor camp areas, and (2) the larger consumer population potentially at risk because of a breakdown in sanitation in some process especially vulnerable to contamination, such as water or food processing.

Although there are as yet no documented instances of greatly increased transmission of protozoa and helminths associated with agricultural migration, this does not mean that increased transmission is not occurring. It could reasonably reflect that few are looking for signs of infection, and the disease is not yet manifest.

Additional information for the evaluation of the potential health hazards in this migration is needed. The pattern established between Mexico and the United States for venereal disease control among Mexican agricultural migratory workers is of great interest and may have applications in the study and possible control of protozoan and helminthic diseases.

The finding of W. bancrofti and M. ozzardi among the British West Indians from St. Kitts, Antigua, and the Barbados indicates the parasites are present on these islands.

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This paper reports the findings obtained in a study carried out in southern India to determine the prevalence and seasonal variation of beta-hemolytic streptococcus throat infections and the comparative incidence of the A, B, C, G antigenic groups.

BETA-HEMOLYTIC STREPTOCOCCI IN SURVEY THROAT CULTURES IN AN INDIAN POPULATION

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Introduction

WITH the persisting interest in the subject of correlation of the incidence of rheumatic fever and rheumatic heart disease with streptococcal infection it seemed worth while to undertake a study of these in an Indian setting. Similar studies conducted elsewhere have been reported in the literature and will be discussed later as results are compared with the results of our study. In some there were widely differing findings. For example, Pike and Fashena[1] in a single-culture series found about 42 per cent of their subjects to be carriers of beta-hemolytic streptococci, 25 per cent to be carriers of Antigenic Group A strains; but Bunn and Bennett[2] found a gross carrier rate of only 6 per cent. Quinn and his colleagues,[3] in the second year of an extensive study, found 18 per cent of their cultures (including duplicates from the same subjects) to be positive for beta-hemolytic streptococci and 13 per cent for Antigenic Group A strains. Saslaw and Streitfeld[4] reported that 14 per cent of the cultures from a large group of children were positive for Group A streptococci. Such figures differ considerably from those which emerged from the Vellore study, here reported, in which specimens from 6-10-year-old children—comparable to the age groups in the reports cited—showed about 50 per cent of the specimens to be positive for beta-hemolytic streptococci, but only about 6 per cent to be positive for Antigenic Group A strains.

The study was conducted during 1957-1958. Throat swabs were obtained from various groups of subjects in an attempt to determine in cross-section the normal prevalence of beta-hemolytic streptococci in various age groups and the variation in antigenic groups and types of the strains isolated. The possibility of seasonal variation was also considered and the program was planned to include three series of cultures taken during the Autumn Rainy Season, the Winter Cold Season, and the Spring Hot Season. One culture from each subject was obtained. For each series the number of specimens represented the number of subjects, i.e., there was no duplication. From series to series, however, some of the subjects were the same, though no attempt was made to compare the two or three cultures which were obtained from them. The various groups included were as follows:

1. Children attending the outpatient clinics of the Christian Medical College Hospital

(designated OC in tables) and of the mobile dispensary (DC) at stations within a radius of about 20 miles; the health clinics for Christian Medical College and Hospital staff children (SC); town children (RC), in cooperation with the Red Cross; preschool village children (KC) at the Christian Medical College Kavanur Rural Health Center; and children (V) attending schools in villages where the Christian Medical College Department of Preventive Medicine was carrying on systematic work in an area not covered by the mobile dispensary. The ages of those in the various C groups were up to 15 years.

2. "Teen-age" young people, including nonresident Voorhees College, Vellore, students (designated TY in tables); Christian Medical College preclinical medical students (MY); students in the Christian Medical College School of Nursing (HY); and others attending the outpatient clinics of the Christian Medical College main hospital, branch hospitals (V), or mobile dispensary. The majority in the Y groups were from 16 to 20 years of age.

3. Adults attending the outpatient clinics of the Christian Medical College main hospital (designated OA in tables), branch rural hospital (V), or mobile dispensary (DA). The majority in the A groups were above the age of 20 years.

Early in the course of each series of specimens there was no attempt to select patients. Later, in order to get fairly comparable numbers in the various age groups from series to series selection by age was necessary. It is felt, however, that this did not interfere with the random distribution desired for the study. During the Spring Hot Season, the staff was depleted to such an extent that it was decided to concentrate on the age groups 25 years and younger. Strictly speaking, therefore, the Spring Hot Season V series of specimens is not comparable to the Autumn V and Winter V series in that the former did not contain subjects in the older age groups. From the viewpoint of proposed future correlation of our findings with primary cases of rheumatic fever this modification of our plan seemed satisfactory.

Vellore, South India, is a town of about four square miles area and 130,000 population, with the majority of the people living in small houses crowded closely together, and in general not well lighted or ventilated. In the surrounding villages from which the Rural Health Center and the mobile dispensary patients were drawn the population is probably twice that of Vellore, as estimated from actual figures for 11 village areas, and most of the houses are mud-walled, thatch-roofed, and huddled in tight little groups. The village schools likewise cannot be said to be well ventilated, though the colleges from which the teen-age group was drawn do have airy well-lighted classrooms.

Vellore and the surrounding villages are situated at a northern latitude of about 12° and the altitude range is about 700-1,000 feet. Temperature and rainfall data as reported in the daily newspaper during the period of our study are given below.

	Temperature, °C				Rainfall, mm		No. Days on Which Rain Fell
	Average		Range				
	Max.	Min.	Max.	Min.	Total	Range/ Day	
Autumn series 1957							
63 days, 17/10-18/12	29	21	31-25	29-17	297	46-1	25
Winter series 1958							
52 days 15/1-7/3	32	20	36-28	29-16	31	30-1	2
Spring series 1958							
25 days 23/4-17/5	37	26	41-30	38-23	38	23-1	4

Procedures

Individual swabs, sterilized in separate test tubes, and numbered tubes containing about 2 ml B.B.L.* Streptosel Broth were supplied along with sterile tongue depressors to the physicians, who had been instructed to avoid tongue and cheeks and to pass the swab over the tonsils and around the pharynx and then introduce the charged swab into the tube of broth. Patients' names, ages, and outpatient numbers (if clinic patients) were recorded simultaneously. A lapse of about three hours usually followed collection of the swab cultures and inoculation of blood agar media in the laboratory.

At the start of the survey each specimen was cultured in three ways: by (1) streak, and (2) pour plate procedures from the three-hour streptosel broth using B.B.L. Trypticase Soy Agar and about 10 per cent defibrinated sheep blood, and (3) streak inoculation from the streptosel broth after it had been incubated overnight. All plates were examined first after overnight incubation and, if then devoid of beta-hemolytic colonies, after a further 24-hour incubation. After about 150 specimens had been processed in this way, the results were compared and it was decided that on subsequent specimens the primary streak plate would be omitted.

Whenever beta-hemolytic colonies were present, subcultures of from one to four were made by surface-streaking of Trypticase Soy Blood Agar to check for purity and test for bacitracin sensitivity. Bacitracin was made up in concentration of 20 units/ml, and kept frozen at −20° C in one ml quantities. Discs of Whatman No. 1 filter paper were placed on the inoculated plate and moistened with a loopful of the antibiotic. After growth, stab subcultures were made into semisolid B.B.L. Cystine Trypticase Agar for maintenance until the antigenic grouping procedure could be done. Cotton stoppers on the tubes were waxed and cultures were stored at about 6° C to diminish drying out of the medium. B.B.L. Trypticase Soy Broth was used routinely for subculture from the maintenance medium of strains isolated from the first two series (autumn and winter) but was not available for all in the third series and was replaced by Tryptose Phosphate Broth (Difco† tryptose).

The plan was to group at least two isolates from each positive culture. However, experience with 54 cultures showed that in 51 the grouping of two, three, or four isolates showed always the same result. In the other three, one proved to have A and C strains, one B and G, and one C and G. Random selection on the basis of slight differences in colony morphology, hemolytic activity, or bacitracin sensitivity did not seem sufficient for detection of multiple groups in significant incidence; and the time and staff available did not permit continuance of this. The multiple isolates were subcultured in turn, however, if failure to obtain growth from maintenance cultures occurred, before "no growth" was recorded for the antigenic grouping procedures. Fifty ml round-bottom centrifuge tubes containing about 40 ml broth were inoculated and when they showed satisfactory growth extraction in hot N/5 HCl was carried out by the standard procedure.[5] The crystal clear supernates were stored at −20° C in a deep freezer for testing at a later date by the capillary tube procedure.[5]

At the start, grouping serum obtained through Dr. Winston H. Price from Dr. Elaine L. Updyke, Communicable Disease Center, PHS, Chamblee, Ga., was used, but this supply was exhausted before the first series had been completed and was supplemented by serum from

* Baltimore Biological Laboratories, Baltimore, Md.

† Difco Laboratories, Incorporated, Detroit, Mich.

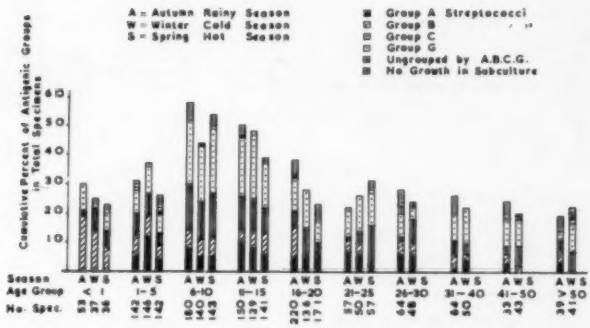

Figure 1—Antigenic Groups of Positive Cultures by Seasons with Reference to the Total Specimens from Subjects in the Various Age Groups

the Difco Laboratories. All the typing serum used was from the USPHS center.

Results

The bacteriologic results have been tabulated in various ways to permit study of interrelationships of various factors. Thus in Table 1, and in Figures 1 and 2, breakdown by age and season is shown with percentage calculations based on the total number of specimens examined from subjects in each age group. A glance will show that with regard to total incidence of beta-hemolytic streptococcus cultures the figures fall essentially into normal distribution curves having peaks twice in the 6-10 and once in the 11-15-year-age group.

It should be noted that place is given in the tables and figures to those beta-hemolytic streptococci isolates which failed to grow on subculture, and that the percentage figures may have been somewhat higher had it been possible to include in the antigenic groups proportionate "no growth" isolates. This problem of "no growth" was not a peculiarity of our study, though inclusion of table headings and figure bars to cover such isolates seems to be. Quinn, et al.,[3] for example, included grouping data for less than half of their isolates and it may be presumed that "no growth" accounts for

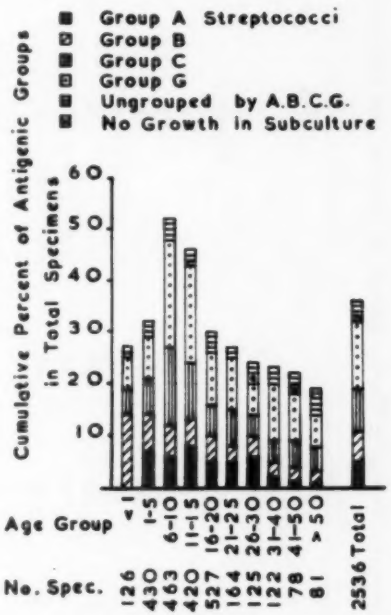

Figure 2—Antigenic Groups of Positive Cultures for the Project with Reference to the Total Specimens from Subjects in the Various Age Groups

Table 1—Antigenic Groups of Positive Cultures by Seasons, with Reference to the Total Specimens from Subjects in the Various Age Groups

Age Group	Total Specimens	Beta-Strep No.	Beta-Strep %	Group A %	Group B %	Group C %	Group G %	Ungrouped %	No Growth %
				Autumn Rainy Season					
<1	53	16	30.2	0	18.9	1.9	9.4	0	0
1- 5	142	45	31.7	4.9	8.5	7.0	8.5	0	2.8
6-10	180	105	58.3	8.3	5.6	16.1	22.2	0	6.1
11-15	150	76	50.7	10.0	4.0	12.0	20.0	1.3	3.3
16-20	220	85	38.6	4.5	10.5	6.4	10.9	0.9	5.4
21-25	57	13	22.8	7.0	3.5	1.8	8.8	0	1.8
26-30	64	18	28.1	6.3	4.7	1.6	7.8	3.1	4.7
31-40	64	17	26.6	1.6	4.7	4.7	9.4	0	6.3
41-50	33	8	24.2	3.0	3.0	3.0	9.1	0	6.1
>50	39	7	18.0	2.6	5.1	2.6	2.6	0	5.1
Total	1,002	390	38.9	5.8	7.2	7.9	13.1	0.6	4.4
				Winter Cold Season					
<1	37	9	24.3	0.0	13.5	8.1	0.0	0.0	2.7
1- 5	146	55	37.7	12.3	6.8	8.2	8.9	0.0	1.4
6-10	140	60	42.9	5.0	5.7	12.9	18.6	0.7	0
11-15	129	62	48.1	7.8	6.2	10.9	22.5	0.8	0.0
16-20	136	38	27.9	5.1	1.5	8.8	12.5	0.0	0.0
21-25	50	13	26.0	6.0	4.0	4.0	12.0	0	0
26-30	48	12	25.0	6.2	4.2	8.3	4.2	2.1	0
31-40	50	11	22.0	4.0	2.0	4.0	12.0	0	0
41-50	43	9	20.9	0	2.3	7.0	9.3	2.3	0
>50	41	9	22.0	0	0	7.3	9.8	0	4.9
Total	820	278	33.9	6.1	4.8	8.9	13.0	0.5	0.6

Spring Hot Season

<1	36	8	22.2	0.0	8.3	5.6	5.6	0	2.8
1- 5	142	36	25.4	3.5	4.9	4.2	7.0	0.7	4.9
6-10	143	77	53.8	4.9	7.0	15.4	21.7	0	4.9
11-15	141	54	38.3	5.7	7.1	9.2	14.2	0	2.1
16-20	171	40	23.4	5.3	1.2	4.1	7.0	0	5.8
21-25	57	18	31.6	1.8	1.8	14.0	10.5	0	3.5
26-30	13	0							
31-40	8	1	4.2	0	0	0	4.2	0	0
41-50	2	0							
>50	1	0							
Total	714	234	32.8	4.2	4.6	8.1	11.5	0.1	4.2

Total

<1	126	33	26.2	0	14.3	4.8	5.6	0	1.6
1- 5	430	136	31.6	7.0	6.7	6.5	8.1	0.2	3.0
6-10	463	242	52.3	6.3	6.0	14.9	21.0	0.2	3.9
11-15	420	192	45.7	7.9	5.7	10.7	18.8	0.7	1.9
16-20	527	163	30.9	4.9	5.1	6.3	10.1	0.4	4.2
21-25	164	44	26.8	4.9	3.0	6.7	10.4	0	1.8
26-30	125	30	24.0	5.6	4.0	4.0	5.6	2.4	2.4
31-40	122	29	23.8	2.5	3.3	4.1	10.7	0	3.3
41-50	78	17	21.8	1.3	2.6	5.1	9.0	1.3	2.6
>50	81	16	19.8	1.2	2.5	4.9	6.2	0	4.9
Total	2,536	902	35.6	5.4	5.7	8.3	12.6	0.4	3.1

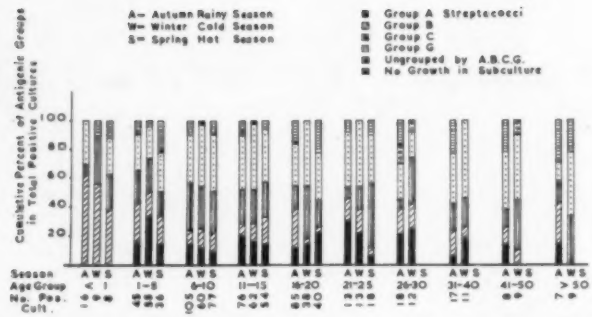

Figure 3—Antigenic Groups of Positive Cultures by Seasons with Reference to the Total Positive Cultures from Subjects in the Various Age Groups

the remainder. In the Vellore series subcultures failed to grow from less than 9 per cent of the positive specimens. It should be mentioned again that in general subcultures of at least four colonies were made from the primary cultures, and "No Growth" was recorded only after all such subcultures failed to yield growth for antigen extraction.

The failure to detect Group A streptococci in the 126 specimens from babies under one year of age is of interest, but when Group A isolate figures for the other subjects are examined with reference to age groups of the subjects no definite or consistent pattern of incidence or seasonal variation is apparent. The comparatively, and rather consistently, larger percentage of Group C and Group G isolates is worthy of note in that these strains are known to produce streptolysin O.[5] Over-all figures for the study showed about 7 per cent of the 1-15-year-old subjects to be carriers of Group A streptococci, about 5 per cent of the 16-30-year subjects, and about 2 per cent of those over 30 years old. Figures for Group C and Group G isolates were considerably higher for these three broad groups of subjects: about 11, 6, and 5, and 17, 9, and 9, respectively. The Group G positive specimens in the 6-15-year-old children were especially striking.

Table 2 and Figures 3 and 4 present the same data but with percentages calculated on the basis of total positive cultures isolated from subjects in each age group. Over-all figures showed only a little difference between the percentage of positive cultures that were found to be Group A strains in the 1-15 and 16-30-year-age groups, but quite a large difference between the Group A's for these two and the 31-year-and-above group. The percentages of G strains isolated is again striking.

Table 3 and Figures 5 and 6 present the survey data with reference to the various social groups of subjects from whom cultures were obtained and with percentage calculations of the antigenic groups of beta-hemolytic streptococci isolated based on the total specimens in each subject group. It may be seen in the subtotals that variations tend to equalize each other, with no constant pattern of change from season to season or group to group. The V group included subjects of all ages, though only from the more rural or village areas. The areas drawn from were in a direction from Vellore not included in the mobile dispensary routes. It would

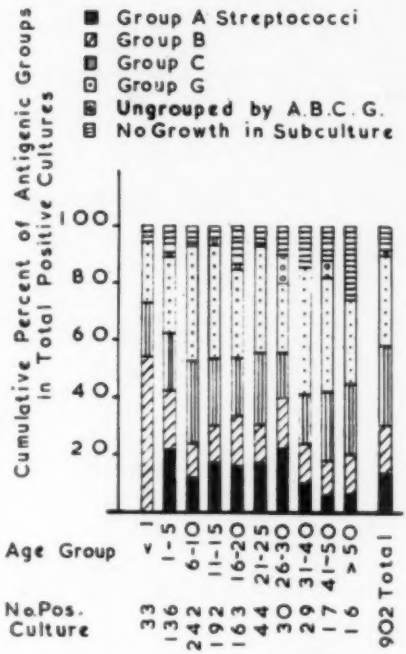

Figure 4—Antigenic Groups of Positive Cultures for the Project with Reference to the Total Positive Cultures from Subjects in the Various Age Groups

seem to be of some interest that percentages of antigenic groups isolated from them correlated closely with the over-all totals of the survey.

The KC group (children attending clinics at the Kavanur Rural Health Center about 14 miles from Vellore) showed the highest incidence of Group A infections, and the MY (preclinical medical students) the lowest, remarkably low, as a matter of fact. Aside from these the other groups seemed more or less comparable in the incidence of Group A cultures. A glance at the Group B figures shows that the student nurses had the lowest incidence, with the adult groups next higher, and the medical students highest. For Group C strains, the highest incidence occurred in the Red Cross Clinic children, the lowest in the student nurses. The mobile dispensary clinic children showed the highest incidence of Group G "infections," the Kavanur children the lowest, but the proportionately large number of Group G strains in general is of interest.

In Table 4 and Figures 7 and 8 the same data as given in Table 3 are presented with percentage calculations of the antigenic groups based on the total positive beta-hemolytic streptococcus cultures isolated within each subject group. The occurrence of Group A strains in

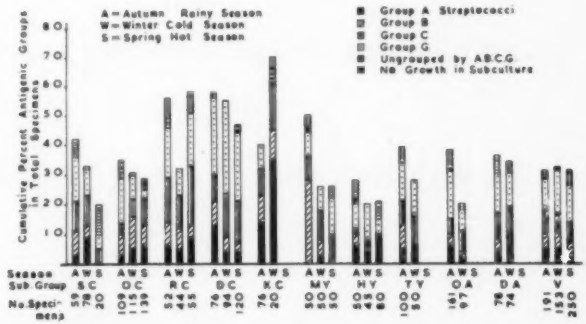

Figure 5—Antigenic Groups of Positive Cultures by Seasons with Reference to the Total Specimens from Subjects in the Various Social Groups (see Introduction for explanation of legend, SC, OC, RC, etc.)

Table 2—Antigenic Groups of Positive Cultures by Seasons with Reference to the Total Positive Cultures from Subjects in the Various Age Groups

Age Group	Total Specimens	Beta-Strep No.	Beta-Strep %	Group A %	Group B %	Group C %	Group G %	Ungrouped %	No Growth %
				Autumn Rainy Season					
<1	53	16	30.2	0	62.5	6.3	31.3	0	0
1- 5	142	45	31.7	15.6	26.7	22.2	26.7	0	8.9
6-10	180	105	58.3	14.3	9.5	27.6	38.1	0	10.5
11-15	150	76	50.7	19.7	7.9	23.7	39.5	2.6	6.6
16-20	220	85	38.6	11.8	27.1	16.5	28.2	2.4	14.1
21-25	57	13	22.8	30.8	15.4	7.7	38.5	0	7.7
26-30	64	18	28.1	22.2	16.7	5.6	27.8	11.1	16.7
31-40	64	17	26.6	5.9	17.6	17.6	35.3	0	23.5
41-50	33	8	24.2	12.5	12.5	12.5	37.5	0	25.0
>50	39	7	18.0	14.3	28.6	14.3	14.3	0	28.6
Total	1,002	390	38.9	14.9	18.5	20.3	33.6	1.5	11.3
				Winter Cold Season					
<1	37	9	24.3	0	55.6	33.3	0	0	11.1
1- 5	146	55	37.7	32.7	18.2	21.8	23.6	0	3.6
6-10	140	60	42.9	11.7	13.3	30.0	43.3	1.7	0
11-15	129	62	48.1	16.1	12.9	22.6	46.8	1.6	0
16-20	136	38	27.9	18.4	5.3	31.6	44.7	0	0
21-25	50	13	26.0	23.1	15.4	15.4	46.1	0	0
26-30	48	12	25.0	25.0	16.7	33.3	16.7	8.3	0
31-40	50	11	22.0	18.2	9.1	18.2	54.5	0	0
41-50	43	9	20.9	0	11.1	33.3	44.4	11.1	0
>50	41	9	22.0	0	0	33.3	44.4	0	22.2
Total	820	278	33.9	18.0	14.0	26.3	38.5	1.4	1.8

Spring Hot Season

<1	36	8	22.2	0	37.5	25.0	25.0	0	12.5
1- 5	142	36	25.4	13.9	19.4	16.7	27.8	2.8	19.4
6-10	143	77	53.8	9.1	13.0	28.6	40.3	0	9.1
11-15	141	54	38.3	14.8	18.5	24.1	37.0	0	5.6
16-20	171	40	23.4	22.5	5.0	17.5	30.0	0	25.0
21-25	57	18	31.6	5.6	5.6	44.4	33.3	0	11.1
26-30	13	0							
31-40	8	1							
41-50	2	0	4.2	0	0	0	100.0	0	0
>50	1	0							
Total	714	234	32.8	12.8	14.1	24.8	35.0	0.4	12.8

Total

<1	126	33	26.2	0	54.5	18.2	21.2	0	6.1
1- 5	430	136	31.6	22.1	21.3	20.6	25.7	0.7	9.6
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16-20	527	163	30.9	16.0	16.7	20.2	32.5	1.2	13.5
21-25	164	44	26.8	18.2	11.4	25.0	38.6	0	6.8
26-30	125	30	24.0	23.3	16.7	16.7	23.3	10.0	10.0
31-40	122	29	23.8	10.3	13.8	17.2	44.8	0	13.8
41-50	78	17	21.8	5.9	11.8	23.5	41.2	5.9	11.8
>50	81	16	19.8	6.3	12.5	25.0	31.3	0	25.0
Total	2,536	902	35.6	15.3	16.0	23.3	35.5	1.2	8.8

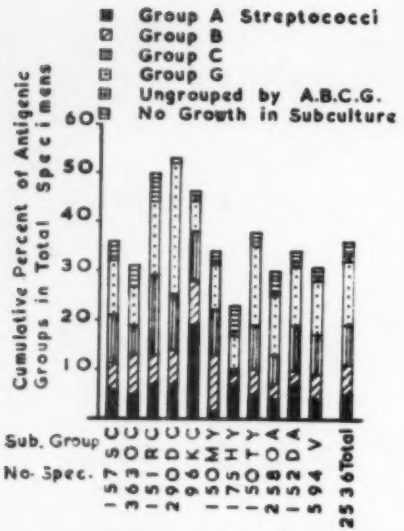

Figure 6—Antigenic Groups of Positive Cultures for the Project with Reference to the Total Specimens from Subjects in the Various Social Groups (see Introduction for explanation of legend, SC, OC, RC, etc.)

the KC group stands out in sharper contrast in this table and the high incidence in the HY (first and second year student nurses) is brought to greater prominence, though the picture with regard to the MY group remains essentially the same. The pictures of the comparative incidences of the other antigenic groups are relatively unchanged.

It may be noted that in all subject groups by either analysis the G strains outnumbered the A strains significantly, except in the KC group where the relationship was reversed.

Repeated attempts with undiluted and diluted extracts were made to determine the antigenic types of the Group A isolates. All these from the specimens of the Autumn Rainy Season Series and about 60 from the other two series were tested with antiserums for Types 1, 2, 4, 6, 12, 28, 30. These serums were chosen on the basis of findings in the laboratories under the direction of Dr. Price[6] where most of the strains isolated were one or the other of these types. No positive reaction was obtained.

About 50 of the extracts from isolates of the Winter and Spring Series were tested with all the antiserums* available. One culture from a 20-year-old student nurse gave a reaction with Type 46 antiserum and was the only one which gave what we considered to be a positive reaction. Occasionally faint turbidity was observed but repeated tests with undiluted and diluted extracts ruled out the possibility of their significance. No control strains of the various types were available for study. The possibility of enzyme activity and destruction of the antigen in our cultures was considered, but this did not seem a reasonable explanation for consistent failure to obtain positive reactions with typing serum. It was decided to send 15 cultures to Dr. Updyke. The only one found typable in her laboratory with the serums available at that time was the one which we had found to be Type 46, which she confirmed.

Findings in Vellore with respect to bacitracin sensitivity are of interest. In the Spring Hot Season series of cultures carried out entirely by the same individual 29 or 97 per cent of the A strains isolated were found to be bacitracin-sensitive and only one, or 3 per cent resistant. Ninety-seven per cent of the 58 C strains were bacitracin-resistant and only two, or 3 per cent sensitive. None of the 33 B strains was bacitracin-sensitive. In the G group, however, of 85 strains 23, or 27 per cent, were bacitracin-sensitive and 62, or 73 per cent, resistant. Had bacitracin sensitivity been used as indicative of Group A strains 54 would have been labeled thus, 29 correctly, 25 incorrectly. Had resistance been taken to exclude Group A, 151 would have been correctly elimi-

* Types 1-6; 8; 11-15; 17-19; 22-26; 28-33; 36-44; 46; 47. See text for acknowledgment.

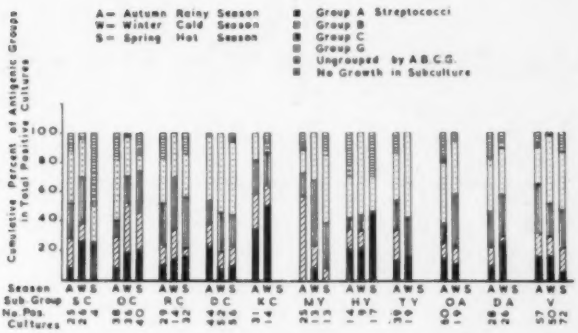
A— Autumn Rainy Season
W— Winter Cold Season
S— Spring Hot Season
Group A Streptococci
Group B
Group C
Group G
Ungrouped by A.B.C.G.
No Growth in Subculture
Cumulative Percent of Antigenic Groups in Total Positive Cultures
100
80
60
40
20
Season A W S A W S A W S A W S A W S A W S A W S A W S A W S A W S A W S
Sub Group S C O C R C D C K C M Y H Y T Y O A D A V
No. Pos. Cultures 26 64 28 40 29 42 42 40 31 4 25 13 14 17 1 30 1 8 9 26 26 57 30 82

Figure 7—Antigenic Groups of Positive Cultures by Seasons with Reference to the Total Positive Cultures from Subjects in the Various Social Groups (see Introduction for explanation of legend, SC, OC, RC, etc.)

nated, one incorrectly. Early in our study it had seemed from bacitracin sensitivity results that nearly 25 per cent of our beta-hemolytic streptococcus isolates were Group A strains. This was mentioned by Dr. Kutumbiah[7] of the Christian Medical College's Department of Medicine in his review of 25 years of the study of rheumatic fever and rheumatic heart disease in India. As shown by serologic test, however, this was not the case. It may be stated parenthetically that it was found essential to use a low concentration of bacitracin to prevent even wider discrepancy.

Discussion

As seen in Table 1 when total specimens for the Vellore project are considered, the peak incidence of positive beta-hemolytic streptococcus throat cultures, 52 per cent, occurred in the 6-10-year-old children. Such a finding was reported also by Pike and Fashena[1] whose study on subjects under 15 years of age dealt with the frequency of hemolytic streptococci in the throats of well Mexican, Negro, and white children appearing at venereal disease and dental clinics in Dallas, Tex., over a 13-month period. They examined 900 throat cultures from 756 children and found about 42 per cent of the cultures positive.

Quinn, Denny, and Riley[3] reported on

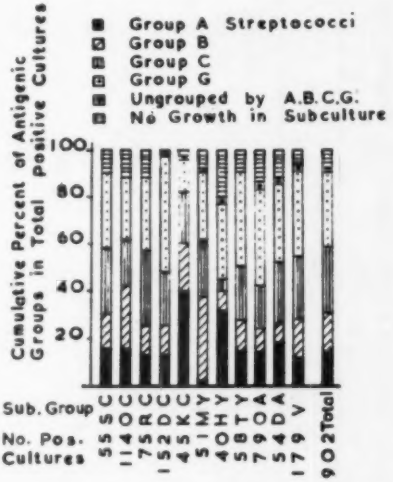
Group A Streptococci
Group B
Group C
Group G
Ungrouped by A.B.C.G.
No Growth in Subculture
Cumulative Percent of Antigenic Groups in Total Positive Cultures
100
80
60
40
20
Sub. Group S O R D K M H T Y A D V Total
No. Pos. Cultures 55 14 7 12 5 1 4 5 1 4 10 8 7 9 4 6 1 7 9 2

Figure 8—Antigenic Groups of Positive Cultures for the Project with Reference to the Total Positive Cultures from Subjects in the Various Social Groups (see Introduction for explanation of legend, SC, OC, RC, etc.)

Table 3—Antigenic Groups of Positive Cultures by Seasons with Reference to the Total Specimens from Subjects in the Various Social Groups*

Subject Group	Total Specimens	Beta-Strep No.	Beta-Strep %	Group A %	Group B %	Group C %	Group G %	Ungrouped %	No Growth %
				Autumn Rainy Season					
S C	59	25	42.4	3.4	8.5	10.2	15.3	0	5.1
O C	109	38	34.9	2.8	7.3	3.7	14.7	0	6.4
R C	52	29	55.8	5.8	7.7	15.4	17.3	0	9.6
D C	76	44	57.9	13.2	7.9	9.2	26.3	0	1.3
K C	76	31	40.8	14.5	9.2	9.2	7.9	0	0
Total C	372	167	44.9	7.8	8.1	8.6	16.1	0	4.3
M Y	50	25	50.0	0	28.0	8.0	8.0	2.0	4.0
H Y	50	14	28.0	6.0	4.0	2.0	8.0	2.0	6.0
T Y	100	39	39.0	5.0	8.0	8.0	13.0	0	5.0
Total Y	200	78	39.0	4.0	12.0	6.5	10.5	1.0	5.0
O A	161	60	37.3	5.6	3.7	5.0	15.5	1.2	6.2
D A	78	28	35.9	3.8	3.8	9.0	12.8	0	6.4
Total A	239	88	36.8	5.0	3.8	6.3	14.6	0.8	6.3
V	191	57	29.8	4.7	4.7	9.9	7.8	1.1	1.6
Total	1,002	390	38.9	5.8	7.2	7.9	13.1	0.6	4.4
				Winter Cold Season					
S C	78	26	33.3	9.0	3.8	10.3	9.0	0	1.3
O C	115	36	31.3	6.1	10.4	6.1	7.8	0	0.9
R C	44	14	31.8	4.5	6.8	11.4	9.1	0	0
D C	94	52	55.3	4.2	5.5	14.9	30.8	0	0
K C	20	14	70.0	35.0	10.0	15.0	0	5.0	5.0
Total C	351	142	40.5	7.7	7.1	10.5	14.0	0.3	0.9

M Y	50	13	26.0	2.0	6.0	10.0	8.0	0	0
H Y	45	9	20.0	4.4	2.2	2.2	11.1	0	0
T Y	50	19	38.0	6.0	0	10.0	22.0	0	0
Total Y	145	41	28.3	4.1	2.8	7.6	13.8	0	0
O A	97	19	19.6	2.1	2.1	7.2	7.2	0	1.0
D A	74	26	35.1	9.5	1.3	9.5	10.8	2.7	1.3
Total A	171	45	26.3	5.2	1.8	8.2	8.8	1.2	1.2
V	153	50	32.7	5.2	4.6	7.2	15.0	0.7	0
Total	820	278	33.9	6.1	4.8	8.9	13.0	0.5	0.6
				Spring Hot Season					
S C	20	4	20.0	0	0	5.0	5.0	0	10.0
O C	139	40	28.8	5.8	7.2	8.6	2.9	0	4.3
R C	55	32	58.2	9.1	3.6	20.0	18.2	0	7.3
D C	120	56	46.7	4.2	6.7	10.0	23.3	0.8	1.7
Total C	334	132	39.5	5.4	6.0	10.8	12.9	0.3	4.2
M Y	50	13	26.0	0	2.0	8.0	12.0	0	4.0
H Y	80	17	21.3	10.0	0	0	5.0	0	6.3
Total Y	130	30	23.1	6.2	0.8	3.1	7.7	0	5.4
V	250	72	28.8	1.6	4.8	7.2	11.6	0	3.6
Total	714	234	32.8	4.2	4.6	8.1	11.5	0.1	4.2
				Total					
S C	157	55	35.0	5.7	5.1	9.6	10.8	0	3.8
O C	363	114	31.4	5.0	8.3	6.3	8.0	0	3.8
R C	151	75	49.7	6.6	6.0	15.9	15.2	0	6.0
D C	290	152	52.4	6.6	6.6	11.4	26.6	0.3	1.0
K C	96	45	46.9	18.8	2.4	10.4	6.3	1.0	1.0
Total C	1,057	441	41.7	7.0	7.1	9.9	14.4	0.2	3.1

* See Introduction for explanation of legend, SC. OC, DC, etc.

Table 3—Continued

Subject Group	Total Specimens	Beta-Strep No.	Beta-Strep %	Group A %	Group B %	Group C %	Group G %	Ungrouped %	No Growth %
M Y	150	51	34.0	0.7	12.0	8.7	9.3	0.7	2.7
H Y	175	40	22.9	7.4	1.7	1.1	7.4	0.6	4.6
T Y	150	58	38.7	5.3	5.3	8.7	16.0	0	3.3
Total Y	475	149	31.4	4.6	6.1	5.9	10.7	0.4	3.6
O A	258	79	30.6	4.3	3.1	5.8	12.4	0.8	4.3
D A	152	54	35.5	6.6	2.6	9.2	11.8	1.3	4.0
Total A	410	133	32.4	5.1	2.9	7.1	12.2	1.0	4.1
V	594	179	30.1	3.5	4.7	8.1	11.3	0.5	2.0
Total	2,536	902	35.6	5.4	5.7	8.3	12.6	0.4	3.1

the natural occurrence of hemolytic streptococci in normal children attending three public schools in Nashville, Tenn., mostly between the ages of 8 and 10 years. They followed the children with repeat cultures and in the second year of their study found about 59 per cent showing cultures at some time with beta-hemolytic streptococci, though of the total cultures only about 18 per cent were positive.

Our figures seem to indicate a closer agreement with those of Pike and Fashena, since within each seasonal series each specimen came from a different subject. In our 6-10-year group 58 per cent, 43 per cent, and 54 per cent positive cultures were obtained in the three seasons studied. And in our total 15-year-and-younger group, 46 per cent, 41 per cent, and 38 per cent positive cultures were obtained. This "agreement" is very likely due to the similarity of cultural methods employed by Pike and Fashena and by the present authors in that enrichment broth was used prior to agar plate inoculation. In the Dallas cultures it was found that about 25 per cent showed the presence of Group A streptococci, whereas in the second year group of Nashville specimens about 13 per cent were positive for Group A streptococci. In the 6-10-year-old Vellore children the 463 specimens for the year showed only 6 per cent to be positive for Group A; and 6 was the figure also for the percentage of A Group positive cultures of the 1,439 specimens for the entire 15-year-and-younger group.

Thus, though incidence of hemolytic streptococcus "infection" would seem comparable in our group of children in India and in these two groups of children in the United States, fewer of the group of Indian children were shown to be carriers of Group A strains. Might this be the result of antagonistic activity between the strains? It may be stated here that, though records were not kept, it was extremely rare to find in the

Vellore subjects that tonsils had been removed. Pike and Fashena[1] reported that in their series the carrier rate was much higher in children with tonsils than in those without tonsils.

In a study conducted by Saslaw and Streitfeld[4] a special group of 1,200 children, with one culture from each, was included as a base for determination of prevalance or pattern in their study of streptococci in children in Miami, Fla. They found that about 14 per cent of the children were carrying Group A streptococci, again a higher incidence for A Group than seen in Vellore children. But Bunn and Bennett,[2] working for community control of rheumatic fever, followed 1,017 children, did cultures on 650 and found only 6 per cent of these to be carriers of beta-hemolytic streptococci, all antigenic groups inclusive.

Findings with regard to antigenic groups other than A in the Vellore series were in general quite different from those reported elsewhere, though often interest in other antigenic groups was not great. Pike and Fashena[1] did consider the incidence of Group C streptococci detected in their study to be of some interest but did not present findings with regard to other groups. Quinn and his associates[3] reported on the five antigenic groups, A, B, C, D, G, and showed that 5 per cent of their grouped strains were C's in contrast to 85 per cent A's and 10 per cent G's. The less than 1 per cent of their cultures was made up of two B strains, one D, and nine that were not A, B, C, D, or G. The over-all figures for distribution of the four antigenic groups A, B, C, G included in the Vellore study showed that of the total strains isolated about 15 per cent were A's, 16 per cent B's, 23 per cent C's, and 36 per cent G's. About 9 per cent could not be recovered from subcultures for grouping; and about 1 per cent of the strains could not be grouped as A, B, C, or G. In the 6-10-year-old Vellore children the figures were found to be about 12 per cent for A strains, 12 per cent for B, 28 per cent for C, and 40 per cent for G strains. Since this group might be considered comparable to that of Quinn, et al., the marked difference in findings is obvious.

It should be noted that for the Nashville study streak cultures were made with subsurface inoculation accomplished only by deliberately digging the inoculating loop into the agar during the process. For the Vellore study as described above melted agar was inoculated. This procedure may account for the large number of Group B organisms isolated in Vellore, since Group B deep colonies were more similar to those of the others than their surface colonies were. Indeed the surface colonies of the Group B organisms encountered in the Vellore survey were quite a contrast to those of the other groups—larger, grayer, moister with smaller, less well defined areas of hemolysis. It is more likely, however, that environment or dietary habits of our subjects may have played a role in producing the differing results.

Pike and Fashena[1] found that Group A carriers were most numerous in the 5-9-year group but that the Group C rate continued to rise with an increase in age, especially in the Mexican and, to some extent, in the Negro children in their study. The Mexican children also had the highest gross carrier rate. The Vellore data indicate that the C rate curve in Dallas or in Vellore may have been a chance finding. In Vellore there was a progressive increase in the seasonal as well as the project's totals from the under one-year to the 1-5-year to the 6-10-year group, but then a decrease in the 11-15 and further decrease in the 16-20-year group.

Quinn, et al.,[3] referred to the "continually changing picture in Nashville" with regard to seasonal and yearly variation in the incidence and types of beta-hemolytic streptococci found, and cited

this as the experience also of Schwentker, Janney, and Gordon. This was also the experience in Vellore with respect to antigenic groups. Comparisons of findings as given in Tables 3 and 4 will show this. No set pattern seemed to be uncovered.

Typing findings have been presented with diffidence, for they suggest that the antigenic types found most commonly elsewhere were not present in the subjects of our study. However, it is apparently not unusual to find a large proportion of isolates nontypable. For instance, Saslaw and Streitfeld[4] found that only 33 per cent were typable of the Group A strains isolated in their "special study" series of cultures from 1,200 individuals, and about 36 per cent of those strains isolated (some duplicates) from the other three groups studied. Also, Quinn and his colleagues[3] found that only 51 per cent of all A strains which they had been able to group could be typed. Saslaw and Streitfeld also add a note to the effect that subsequent study had shown several of the nontypable strains in their series to be "the new type Red Lake" which had apparently been reported first in connection with epidemic acute glomerulonephritis at Red Lake, Minn.

Since 13 of 15 strains sent to Dr. Updyke were found by her also to be nontypable with the serums available, and since the one found in our laboratory to be Type 46 was confirmed by Dr. Updyke as being Type 46, we have described our experience with typing our cultures. The fifteenth strain sent to Dr. Updyke was not recovered from the culture. This strain had been nontypable in our laboratory. Well over 100 strains were subjected to the typing procedure, so it would seem that the pattern of antigenic types of Group A strains isolated from people in the vicinity of Vellore, South India, may be quite different from that in other places, as is the prevalent pattern of antigenic

Table 4—Antigenic Groups of Positive Cultures by Seasons with Reference to the Total Positive Cultures from Subjects in the Various Social Groups[a]

Subject Group	Total Specimens	Beta-Strep No.	Beta-Strep %	Group A %	Group B %	Group C %	Group G %	Ungrouped %	No Growth %
				Autumn Rainy Season					
S C	59	25	42.4	8.0	20.0	24.0	36.0	0	12.0
O C	109	38	34.9	7.9	21.1	10.5	42.1	0	18.4
R C	52	29	55.8	10.3	13.8	27.6	31.0	0	17.2
D C	76	44	57.9	22.7	13.6	15.9	45.5	0	2.3
K C	76	31	40.8	35.5	22.6	22.6	19.4	0	0
Total C	372	167	44.9	17.4	18.0	19.2	35.9	0	9.6
M Y	50	25	50.0	0	56.0	16.0	16.0	4.0	8.0
H Y	50	14	28.0	21.4	14.3	7.1	28.6	7.1	21.4
T Y	100	39	39.0	12.8	20.5	20.5	33.3	0	12.8
Total Y	200	78	39.0	10.3	30.8	16.7	26.9	2.6	12.8

O A	161	60	37.3	15.0	10.0	13.3	41.7	3.3	16.7
D A	78	28	35.9	10.7	10.7	25.0	35.7	0	17.9
Total A	239	88	36.8	13.6	10.2	17.0	39.8	2.3	17.1
V	191	57	29.8	15.8	15.8	33.3	26.3	3.5	5.3
Total	1,002	390	38.9	14.9	18.5	20.3	33.6	1.5	11.3
Winter Cold Season									
S C	78	26	33.3	26.9	11.5	30.8	26.9	0	3.9
O C	115	36	31.3	19.4	33.3	19.4	25.0	0	2.8
R C	44	14	31.8	14.3	21.4	35.7	28.6	0	0.0
D C	94	52	55.3	7.7	9.6	26.9	55.8	0	0.0
K C	20	14	70.0	50.0	14.3	21.4	0.0	7.1	7.1
Total C	351	142	40.5	19.0	17.6	26.1	34.5	0.7	2.1
M Y	50	13	26.0	7.7	23.1	38.5	30.8	0	0
H Y	45	9	20.0	22.2	11.1	11.1	55.6	0	0
T Y	50	19	38.0	15.8	0	26.3	57.9	0	0
Total Y	145	41	28.3	14.6	9.8	26.8	48.8	0	0
O A	97	19	19.6	10.5	10.5	36.8	36.8	0	5.3
D A	74	26	35.1	26.9	3.8	26.9	30.8	7.7	3.9
Total A	171	45	26.3	20.0	6.7	31.1	33.3	4.4	4.4
V	153	50	32.7	16.0	14.0	22.0	46.0	2.0	0.0
Total	820	278	33.9	18.0	14.0	26.3	38.5	1.4	1.8
Spring Hot Season									
S C	20	4	20.0	0	0	25.0	25.0	0	50.0
O C	139	40	28.8	20.0	25.0	30.0	10.0	0	15.0
R C	55	32	58.2	15.6	6.3	34.4	31.3	0	12.5
D C	120	56	46.7	8.9	14.3	21.4	50.0	1.8	3.6
Total C	334	132	39.5	13.6	15.2	27.3	32.6	0.8	10.6

* See Introduction for explanation of the legend, SC, OC, RC, etc.

Table 4—Continued

Subject Group	Total Specimens	Beta-Strep No.	Beta-Strep %	Group A %	Group B %	Group C %	Group G %	Ungrouped %	No Growth %
M Y	50	13	26.0	0	7.7	30.8	46.2	0	15.4
H Y	80	17	21.3	47.1	0	0	23.5	0	29.4
Total Y	130	30	23.1	26.7	3.3	13.3	33.3	0	23.3
V	250	72	28.8	5.6	16.7	25.0	40.3	0	12.5
Total	714	234	32.8	12.8	14.1	24.8	35.0	0.4	12.8
				Total					
S C	157	55	35.0	16.4	14.5	27.3	30.9	0	10.9
O C	363	114	31.4	15.8	26.3	20.2	25.4	0	12.3
R C	151	75	49.7	13.3	12.0	32.0	30.7	0	12.0
D C	290	152	52.4	12.5	12.5	21.7	50.7	0.7	2.0
K C	96	45	46.9	40.0	20.0	22.2	13.3	2.2	2.2
Total C	1,057	441	41.7	16.8	17.0	23.8	34.5	0.5	7.5
M Y	150	51	34.0	2.0	35.3	25.5	27.5	2.0	7.8
H Y	175	40	22.9	32.5	7.5	5.0	32.5	5	20.0
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Total Y	475	149	31.4	14.8	19.5	18.8	34.2	1.3	11.4
O A	258	79	30.6	13.9	10.1	19.0	40.5	2.5	13.9
D A	152	54	35.5	18.5	7.4	25.9	33.3	3.7	11.1
Total A	410	133	32.4	15.8	9.0	21.8	37.6	3.0	12.8
V	594	179	30.1	11.7	15.6	26.8	37.4	1.7	6.7
Total	2,536	902	35.6	15.3	16.0	23.3	35.5	1.2	8.7

groups of beta-hemolytic streptococci found in this area. Further investigation is necessary to substantiate this and to determine the antigenic types which do occur here.

It is hoped that the study begun in Vellore will progress to include streptococcal antibody determinations for correlation with culture survey, bacteriological and viral; and that a large enough group of subjects can be followed for a period of some years to relate these to the occurrence of rheumatic fever in this area.

Summary

This report presents the findings obtained in an eight months' study planned to determine the prevalence and seasonal variation of beta-hemolytic streptococcus throat "infections" and the comparative incidence of the A, B, C, G, antigenic groups in people of an area in the southern part of India.

The findings of gross carrier rates for beta-hemolytic streptococci above 50 per cent in some of the subject groups surveyed was not inconsistent with findings in similar studies carried on elsewhere. Nor was the occurrence of a peak incidence in the 6-10 or 11-15-year-old subjects unexpected.

The picture of the distribution of the antigenic groups of beta-hemolytic streptococci, however, appeared to be quite different from those reported elsewhere. Mention of the over-all totals will suffice here to illustrate this. Of the 2,536 throat cultures examined, 5 per cent were found to be positive for Group A streptococci, 6 per cent for Group B, 8 per cent for Group C, and 13 per cent for Group G. Less than 1 per cent showed the presence of streptococci which failed to fall into one of these four groups.

Expressed on the basis of the 902 positive cultures isolated from the 2,536 specimens 15 per cent were identified as Group A strains, 16 per cent as Group B, 23 per cent as Group C, and 36 per cent as Group G. One per cent of the positive cultures could not be classified as A, B, C, G.

Seasonal variation in the prevalence of "infection" and incidence of antigenic groups of the beta-hemolytic streptococci in the various subject age groups did not fall into a constant pattern, i.e., for one season the incidence of Group A strains, for example, in subjects of one age group might be somewhat higher than for the previous season, and in subjects of the next age group lower than previously.

Likewise, there was no consistent seasonal variation from one social group to another, though variation within a season's series from one social group of subjects to another was sometimes marked.

The preclinical medical student group seemed remarkably free of "infection" with Group A strains. Only one throat culture of the 150 examined was positive for Group A streptococci, though 51 showed the presence of beta-hemolytic streptococci.

Thirteen of the 175 cultures from student nurses revealed Group A "infection" though the total beta-streptococcus positive cultures for the group were 40.

From the 290 cultures from the mobile dispensary's village children subjects 152 gross positives were obtained and 19 Group A's; whereas the Kavanur Rural Health Center's 96 village children's specimens yielded 45 positives of which 18 were identified as Group A's.

Extracts from about 120 isolates were tested with antiserums of Types 1, 2, 4, 6, 12, 28, 30. No positive reactions were obtained.

Extracts from about 50 isolates were tested with all typing serums available. One gave a typical reaction with Type 46 serum.

It appears that the pattern both of antigenic groups of beta-hemolytic streptococci and types within Group A present in throat cultures in Vellore, is differ-

ent than those reported elsewhere, with a predominance of Group G strains rather than Group A, and with the absence of Group A types found commonly in other parts of the world.

Data are given to show that rather frequently bacitracin-sensitive Group G strains of beta-hemolytic streptococci were encountered, very rarely bacitracin-sensitive Group C strains, and never any bacitracin-sensitive Group B strains. The marked difference in the colonial morphology of surface growth of Group B strains in contrast to deep B colonies and in contrast to the surface colonies of streptococci of the other antigenic groups in the study is also mentioned.

ACKNOWLEDGMENT—Dr. Winston H. Price, Division of Medical Ecology, Department of Epidemiology, School of Hygiene and Public Health, Johns Hopkins University, stimulated our interest and provided the necessary financial assistance through a grant from the National Heart Institute, National Institutes of Health, Bethesda, Md.

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Journals Wanted

If there are any readers who have no further need of their November, 1958, September, 1959, March, 1960, November, 1960, and February, 1961, Journals, the Association would be grateful if these would be mailed to Association headquarters at 1790 Broadway, New York 19, N. Y.

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Journal of Public Health

EDITORIALS

We Thank You—

As THE year comes to a close, we wish to express our thanks and appreciation to all those whose counsel and aid we have enjoyed in 1961. A large group of Association members have given willingly of their time and knowledge in reviewing manuscripts and in helping the Editor to establish their suitability for publication in the Journal. This is equally true of those who have prepared the book reviews we published, and of those who advised us of publications that should not be reviewed.

Those who have written "Letters to the Editor" deserve a special comment. It is our profound conviction that while the Journal is primarily devoted to the presentation of basic and applied knowledge relating to the public health, it should also be a forum for the expression of opinion on scientific and professional matters. While not all letters can be published, it has been possible over the past five years to publish a larger number of contributions covering a wider range of subjects. The trend is upward and we believe this is a healthy development which we shall endeavor to foster.

This year, too, the Journal began a section offering abstracts of papers that cannot be published in full. In this way we hope to extend the coverage provided by the Journal. To the authors who permitted us to use their work in this way, we also extend our thanks.

As the year draws to a close, and the Journal completes its 51st volume, we wish you well for 1962. As we move further into the second half-century of the Journal we hope to continue to have the cooperation of our counselors and consultants, and of all those who wish to join us in making the Journal more than ever the vital center of knowledge and opinion in American public health.

Gonorrhea—Still an Important Disease!

A WHO Expert Committee reported in 1959 that "gonorrhea is widespread, remains uncontrolled and is one of the most challenging health problems in many parts of the world." At that time the disease was increasing in 15 of 22 countries that had been studied, and in some areas was spreading particularly among young people. Moreover, it was

pointed out that because of underreporting, the actual incidence is much higher than the reported figures indicate. For example, in the United States the total number of cases is estimated at perhaps from five to ten times the official figure. But, even if one takes the official figures alone, in 1959, gonorrhea was the third most common infectious disease, after measles and streptococcal infections, with syphilis fourth. This trend was confirmed in 1960 at the European Symposium on Gonorrhea, organized by the International Union Against Venereal Diseases and Treponematoses and the Polish Ministry of Health, which met at Krakow, Poland.

The initial successes achieved following the introduction of the sulfonamides and later of penicillin have been reversed in many countries. In others the infection has never really been controlled. The reasons for the failure to control gonorrhea despite technical progress are examined in a recent issue of the WHO Bulletin by a number of specialists who offer proposals for action.[1] Among the reasons offered for the failure of control are the difficulties in defining the reservoir of infection, difficulties in diagnosis, and increasing difficulties in therapy. Furthermore, migration (especially where the population has a strong preponderance of males), homosexuality, and promiscuous sexual behavior among young persons in many communities are also significant factors in the spread of gonorrhea today. Still another factor has been the feeling which developed after the early success of penicillin therapy that gonorrhea had now become a minor infection of little consequence and curable by a single injection. The fact is that salpingitis still occurs in no less than 10 per cent of infected women and causes 2 to 3 per cent of all cases of sterility. Many of those are undiagnosed cases.

Control will improve when there is an awareness of the problem and where existing methods are applied more thoroughly. Epidemiological case finding is essential. The so-called "cluster" and "speed zone" technics that aim at reaching sexual and social contacts with a minimum of delay are very useful. However, these methods may not be applicable in all types of society, and new technics will have to be developed. Attention to the problems of young people through improvement of social conditions will help to bring the disease under control. Social work and legislation will undoubtedly be necessary. Furthermore, improved methods of differential diagnosis are necessary. On the question of treatment, both the WHO Expert Committee in 1959 and the Krakow Symposium in 1960 emphasized that penicillin must remain the basic element of therapy, with the use of large doses to counter resistance.

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LETTER TO THE EDITOR

TO THE EDITOR:

I have just read Dr. Taubenhaus' essentially practical article entitled, "The Administration of Research by Local Health Departments" in the June issue of this Journal. This has been based, obviously, on the author's personal experience and, therefore, will be of great value to many readers.

In this modern day, there is a plethora of technical journals in the public health and medical fields, and the conscientious health officer would have almost a full-time job if he were to read them all. This letter is a plea to my colleagues to avoid redundancy in the interest of the overworked readers of journals.

For example, this statement appears in the article, "The first formal step in setting up a research project is the development of a research design," followed very shortly by this, "A well thought out and well planned design is the first formal step of a successful research project." Again we get a glimpse of the obvious when the author states, although with some reservation, "Usually the more capable the consultant, the better the research design will be"; and surely the next sentence in this quote is an example of tautology, "Many an otherwise excellent research project has failed because of the inability of the involved personnel to devote sufficient time to it. Thus the responsibility of the health officer in planning for and allotting personnel to the project is important."

Lest I be accused of verbosity, I quote only one more example, "Technical consultants usually are selected on the basis of technical competence. . . ."

I am a regular subscriber to your Journal, and I enjoy reading it—when I have time!

R. JOHN GOURLAY, M.D., B.Sc., D.P.H.
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Dental Health for the Special Patient

Representatives of 11 dental schools met in Washington, D. C., September 21-22 to discuss the development of dental student training programs for the care of the special patient, such as the chronically ill, aged, and handicapped. All schools participating expressed an intent to submit requests for Cooperative Project Agreements to further their plans in this special dental student training. The 11 cooperating schools represented at the conference were University of Alabama, Fairleigh Dickinson University, Loyola University, New York University, Northwestern University, University of Pennsylvania, University of Pittsburgh, University of Tennessee, Tufts University, University of Washington, and West Virginia University. Further information from Pierce L. Rollins, Information Specialist, Division of Dental Public Health and Resources, Public Health Service, Washington, D. C.

THE DESIGN AND MAINTENANCE OF OPERATING ROOM AIR CONDITIONING AND VENTILATION SYSTEMS

Engineering and Sanitation Section

VARIOUS references in medical and hospital literature to the operating room air environment as one factor in nosocomial infections led the Committee on Hospital Facilities to initiate two distinct but related surveys in mid-1960 on the design and maintenance of operating room air conditioning and ventilation systems. The two groups of survey respondents were hospital maintenance engineers and hospital air conditioning design engineers. Both survey questionnaires were sufficiently broad to elicit information on maintenance and design engineering practices which might have some significance in regard to the sanitary quality of the air supplied to surgery, as well as the quality of the ambient air in surgery.

Results of the surveys are reported separately by the chairmen of the subcommittees which conducted them. The third portion of this report, prepared by the full committee membership, lists the committee's interim recommendations on operating room air conditioning design objectives. The committee views these objectives as logical extensions of current design practices into areas which recent investigations report as having some significance in minimizing air contamination either within the operating room in general, or immediately above the operating table. Comments on these interim recommendations are solicited by the committee.

DESIGN AND MAINTENANCE OF OPERATING ROOM AIR CONDITIONING AND VENTILATING SYSTEMS AS REPORTED BY HOSPITAL MAINTENANCE ENGINEERS

George S. Michaelsen, M.S.

Questionnaires relating to the design and maintenance of hospital operating room ventilation systems were sent to 482 hospital maintenance engineers throughout the country. Replies were obtained from 205 engineers; 198 of the replies were useful for survey purposes.

Although the sample used in the survey was relatively small, it might be well to note its characteristics. The survey included 6 proprietary, 45 tax supported and 145 voluntary nonprofit hospitals. It will be noted in the tabulation of the data that the results do not total 198 in all cases since all questions were not answered. Of these hospitals there were 151 general, 18 combination teaching and general, and 8 hospitals used for

Table 1—Distribution of Survey Replies by Size of Hospital

Size of Hospital (No. of beds)	<50	51-150	151-250	251-500	501-750	751-1,000	>1,000
No. of hospitals	11	42	45	69	12	9	6

teaching only. There were 19 other types of specialized hospitals. The distribution of the size of the hospitals in the survey is shown in Table 1.

The number of operating rooms in the hospitals ranged from one per hospital to 17 per hospital.

It was felt that the period in which the ventilation system was installed would be of some interest, and it was found that among the hospitals in the survey 2 of the systems were installed in the period of 1921-1930, 8 during 1931-1940, 36 between 1941 and 1950, 70 during 1951-1955, and 77 had systems installed in the period of 1956-1960.

Air Intake Location

Because air at ground level has been considered to be of inferior bacteriological quality to that at higher levels, the inquiry was raised as to the location of the outdoor air intake for surgery in relation to the physical structure of the building; it was learned that 102 hospitals had an intake on the roof or in a penthouse, 77 had the air intake on the sidewall of the hospital, and 18 had the air intake at ground level.

For a similar reason, information was also sought on the actual distance of the outdoor intake above ground in the case of those who had the air intake for surgery on the sidewall. The results are shown in Table 2.

Of the 18 who listed a ground level intake, 12 indicated that the outdoor air intake was less than 5 feet above grade, 3 were from 6-10 feet above grade, and one was 11-15 feet above grade.

Because of the interest in potential pollution of the fresh-air supply, the use of the area adjacent to the outdoor air intake was examined. Where a sidewall location was indicated, 21 said the adjacent area was a driveway or a parking lot, 25 were next to a lawn, and 19 indicated some other use of the adjacent area. Of those indicating a ground level air intake, 6 had a driveway or parking lot, 6 had a lawn, and 3 had other uses for the adjacent area. The fact that the largest number of fresh-air intakes were located a significant distance above the ground indicates an awareness on the part of the designers of these systems of the possibilities of air contamination at ground level.

The question of the proper or adequate distance between an outdoor air intake and other stacks discharging noxious or hazardous materials is difficult to answer. However, in light of the physical dimensions of present-day hospitals, it would appear that in many cases greater distances could be provided between exhaust systems serving contaminated areas and fresh-air inlets to surgery than those distances now being provided as indicated in Table 3.

Humidification

The question has been raised as to whether certain types of humidifiers are possible sources of contamination of the air. In this survey inquiries were made as to existing humidification systems. It was revealed that 47 hospitals used a water spray for humidification of the air supplied to surgery. Of these, 22 recirculated the water, and 12 discharged the excess water to waste. Fifty-seven hospitals used heated evaporating

Table 2—Distance of Sidewall Fresh Air Intake Above Grade

Distance (in ft) above grade	<6	6-10	11-15	16-25	26-40	41-60	61-100
No. of hospitals	10	9	3	11	14	16	11

Table 3—The Number of Hospitals Reporting the Indicated Distances Between Air Intake for Surgery and the Indicated Type of Exhaust

Distance in Feet	Incinerator Stack	Lab Hood Exhaust	Exhaust from Surgery	General Building Vent. Exhaust	Kitchen Vent. Exhaust	Laundry Vent. Exhaust	Toilet Vent. Exhaust	Smoke Stack	Other Vent. Exhausts
Less than 25	4	10	30	11	8	4	21	3	3
25-50	27	27	86	48	30	20	59	18	3
51-75	19	18	20	22	25	11	15	11	1
76-100	29	35	30	32	39	18	29	23	0
Over 100	103	83	20	47	68	109	39	123	3

pans, 64 used steam jets, 8 had a variety of independent humidifying units, and 2 used unheated evaporating pans.

Likewise, it was considered that certain types of dehumidifiers might be indicted as possible sources of air contamination. In this survey, 136 hospitals had cooling coils, 8 had liquid absorbents, and one used solid absorbents for dehumidification.

A question was asked whether bactericidal agents were used in the humidifying water. Twenty-six indicated that they used them and 50 said they did not. The relatively small numbers of replies in regard to the humidifiers is taken to mean that over half the respondents did not have humidifying units in their ventilating systems.

Air Cleaning

The survey sought to find out what types, and combinations of types, of air cleaners are being used to clean the air for surgery. The results are summarized in Table 4.

The data from the survey were examined to see what differences there were in the use of air cleaners for surgery in relation to the age of the system. The data are presented in Table 5.

It is interesting to note from the second column (Table 5) an increase in the number of combinations of air cleaners used in more recent years. Perhaps the reasons for this are that today there are a greater variety of air cleaning devices available and there is a greater consciousness of the need for clean air. The dry air filter is predominantly used where a single air cleaner is indicated. A combination of air cleaning devices will most commonly consist of a dry filter and an electronic filter.

Other Factors Involving Air Quality

In regard to the movement of the air through surgery, 189 indicated that the exhaust air from surgery was discharged out of doors, 5 indicated that the air was recirculated, and 2 stated

Table 4—Types and Combinations of Types of Air Cleaners Used for Surgery

1. Dry filters only	83
2. Viscous impingement only	12
3. Viscous impingement and dry filters	7
4. Electronic filters only	12
5. Electronic and dry filters	40
6. Electronic and viscous impingement and dry filters	12
7. Electronic and viscous impingement	13
8. Other combinations	17

Table 5—Types of Air Cleaners Used for Surgery in Relation to Time System Was Installed

Period in Which System Was Installed	Numbers of Different Comb. of Air Cleaners Used	Viscous Impinge. (% of Total)	Dry Air (% of Total)	Electronic (% of Total)	Use of Multiple Air Cleaners (% of Total)	Use of Electronic Filter in Comb. with Other Types as % of Total	Number of Replies
1921-1930	0	0	100	0	0	0	2
1931-1940	3	11.1	66.7	0	22.2	11.1	9
1941-1950	5	8.3	47.2	2.8	41.7	30.6	36
1951-1955	8	5.7	36	7.1	50	44.4	70
1956-1960	10	5.2	37.7	7.8	48.2	46.7	77

that their systems permitted the air to be recirculated or discharged directly out of doors.

In reply to the questions concerning the existence of air pressure differentials between surgery and the adjacent areas, 141 indicated that the operating rooms were at positive pressures in relation to adjacent areas, 15 indicated negative pressures, and 32 indicated equal pressures.

It is interesting to note that 84 hospitals are making some attempts to determine the bacteriological quality of the air in surgery while 110 said they are not. Of the 84 hospitals reporting, 55 said it was being done by settling plates and 4 by means of air samplers. The others did not specify the method.

Questions were asked also as to the use of acoustic liners in the air supply ducts serving surgery. One hundred and forty-one stated that they did not have acoustic liners, and 48 indicated that they did. Of the 48 having acoustic liners, 5 indicated that they have had some difficulty with acoustic liner material sloughing off, and 39 indicated no trouble.

There is a wide variation in air change rates for surgery. It is interesting to note from Table 6 that a substantial number of hospitals reported air change rates well in excess of those listed in several standards.

Cleaning

In the area of maintenance, questions were asked concerning cleaning methods, the frequency of cleaning or changing air cleaners and other components in the operating room air conditioning system, and how the need for cleaning or changing was determined. For example, in response to the question of how often the air ducts leading to surgery were cleaned, 62 indicated that

Table 6—Rates of Air Change in Surgery

No. of air changes/hr	1-5	6-10	11-15	16-20	>20
No. of hospitals	5	33	38	19	37

this was never done, 38 did it on an annual basis, 2 did it biannually, and 60 did it on some other basis. Visual inspection was used by 81 of the hospitals to determine the need for cleaning the ducts, 12 put it on a regular schedule, and 4 used some other method. The information concerning the cleaning of the ductwork leading to and from surgery may not be too reliable. The questionnaire was not clear as to what information was wanted and there was some confusion on the part of the respondents.

In 11 hospitals the dehumidifiers were cleaned by vacuum methods, 13 used steam cleaning, 18 used a variety of chemicals, and 49 used a combination of other methods.

Tables 7 and 8, respectively, summarize cleaning schedules and the bases for establishing the need for cleaning the air conditioning system components.

An examination of these tables indicates that some form of visual inspection is the most common basis for determining the need for cleaning ventilation and air conditioning equipment. In other words, if it looks dirty, it is cleaned. The second most common method is to put cleaning on a regular schedule. This means the equipment gets cleaned whether it needs it or not. This is sometimes interpreted to mean that the cleaning schedule chosen provides more cleaning than necessary. However, the opposite could easily be true. One would have to examine the basis on which the schedule had been made to determine whether it was adequate. A routine schedule of cleaning also implies that dirt is produced and accumulates at a uniform rate, which may not be the case from one season to the next.

Table 7—Cleaning Schedule (No. of Hospitals)

Frequency	Air Cleaners or Filters	Ventilating Ducts	Humidifiers	Change Humidifier Water	Dehumidifiers
Daily	—		2	5	—
Weekly	52		15	13	13
Monthly	90		38	29	17
Quarterly	22		5		10
Semiannually	7		7		7
Annually	1	38	4		23
Biannually	—	2	—		—
Never	—	62	—		—
Other	17	60	8		24

Table 8—Determination of Need for Cleaning Maintenance (No. of Hospitals)

Basis	Air Cleaners	Ducts	Humidifiers	Dehumidifiers
Pressure drop	31	—	—	—
Visual inspection	103	81	51	63
Regular schedule	34	12	10	6
Other	6	4	5	7

Temperature and Humidity

The precise maintenance of prescribed temperature and humidity conditions in surgery is generally regarded by the maintenance engineering group as quite important. Information on the practices in the respondent hospitals is tabulated in Table 9.

The range of temperatures reported as being maintained in surgery falls within 10 degrees. Relative humidities are spread over a range of 42 per cent although the bulk of the humidity levels is within the range of from 50 to 55 per cent. The temperature and humidity are checked daily in 85, weekly in 21, and at other times in 33 of the hospitals answering this question.

Respondents' Evaluation

Of the engineers replying, 104 considered the ventilating and air conditioning system they have in their hospital operating rooms satisfactory, while 84 did not. This point was examined further and it was found from the replies that 67 per cent of the engineers, having ventilation systems for surgery installed during the decade 1931-1940, were dissatisfied with their systems. This dropped to 56 per cent for the systems installed during the decade 1941-1950. In the case of the systems installed during 1951-1955, 44 per cent of the engineers were dissatisfied, and for systems installed during the period 1956-1960, the dissatisfaction dropped to 35 per cent. From the comments which were volunteered it appears that the dissatisfaction with the older systems centers around the fact that they were designed to produce one set of conditions, as to temperature and humidity, and present-day practice calls for another set of conditions which they cannot meet. It is somewhat disturbing to note, however, that for a variety of reasons, about one-third of the operating room ventilating systems designed and installed in surgery in the last five years are regarded by these hospital maintenance engineers as unsatisfactory.

General Conclusions

In addition to the previous conclusions noted, it also appears that the designers need more information on the specific requirements and limitations of the space they are to air condition and ventilate in order to produce a system which is satisfactory.

Lastly, hospital maintenance engineers apparently need better methods of determining when and how the various components of the air conditioning and ventilation systems are to be cleaned.

Table 9—Temperature and Humidity Maintained in Surgery

Temperature (° F)	(No. of Hospitals)	Relative Humidity (Range-%)	(No. of Hospitals)
70	18	30-32	2
71	6	33-37	0
72	47	38-42	0
73	9	43-47	7
74	28	48-52	50
75	34	53-57	75
76	11	58-62	15
77	2	63-67	8
78	6	68-72	5
80	9		

SURVEY OF DESIGN PRACTICES OF HOSPITAL OPERATING ROOM AIR CONDITIONING AND VENTILATION SYSTEM

Vinson R. Oviatt, M.P.H., F.A.P.H.A.

Survey questionnaires, similar in many respects to those sent to hospital maintenance engineers, were directed to 287 individuals and firms identified as being active in the field of hospital air conditioning and ventilation design. Not only did the survey sheets attempt to collect design practice data suitable for tabulation and comparison, but the respondents were encouraged to contribute any original information bearing on design practice and theory in the following health or safety related areas:

1. Air quality within the operating room from a bacteriological point of view.
2. Physical comfort of operating room occupants.
3. Removal of flammable anesthetic vapors and odors.
4. Control of electrostatic hazards.

The discussion and tabulated material below summarize the information contained in the 99 replies received from this group.

Design Standards

The survey indicated a multiplicity of sources for design standards, ranging from original design by the respondent to manufacturers' recommendations. Only 56 of the respondents reported that elements in their designs were based on one or more official or quasi-official standards. Whether or not the remaining 43 consider recognized standards as being significant enough to use or mention could not be determined. Of the 56 referring to standards, USPHS ("Hill-Burton") standards were listed 28 times,[1] ASHRAE ("Guide") standards were listed 17 times,[2] NFPA Code 56, 17 times,[3] and various state codes, 5 times.

It is of particular interest to note that only 23 of the respondents indicated that the hospital staff had been consulted about the design. Others may consult the hospital staff, but at least only 23 felt that this item was significant enough to check on the questionnaire. This indication can lead to several conclusions, one of the more important being that there appears to be a minimum of communication between the design group and the hospital staff who will use the facilities.

Almost unanimous agreement on two design considerations was elicited from the survey returns. The first was that 98 of the 99 respondents replied that both supply and exhaust ventilation are used; one respondent failed to reply to this question. The second was to supply clean air to the operating room. It is significant to note that there were a number of requests for information received in the returned questionnaires as to the degree it is considered necessary to clean the air. Other comments received advocated stricter standards and the enforcement of standards for air cleaning.

Air Intake and Exhaust Outlet Location

The numerical preferences for general locations for fresh-air intakes and exhaust air outlets are summarized in Table 1(B).

As shown, sidewall locations for fresh-air intakes are strongly favored. The largest number of designers prefer the roof level for exhaust air outlets. Since a variety of potential air pollution sources occur at grade level, the committee was gratified to note that grade level locations for fresh-air intakes are rarely used today.

An examination of Table 2(B), which summarizes design practice with respect

Table 1(B)—Location of Fresh Air Intake and Exhaust Outlets

Location on Building	Supply Air (No. Replies)	Exhaust Air (No. Replies)
Roof level	25	72
Sidewall	45	4
Grade level	1	2
Sidewall and grade level	1	0
Roof level and sidewall	20	10
Conditions indicate	5	6
No response	2	5

to minimum vertical and horizontal distances separating fresh-air intakes and exhaust outlets, shows the wide range of values found in current practice. By their comments, a number of the designers showed an awareness of the need to achieve the maximum separation possible. One inference drawn from the number of returned questionnaires which did not furnish answers on fresh air and exhaust separation is that there is a large element of uncertainty or lack of understanding in this area of design.

Air Cleaning

As mentioned earlier, the design engineers, as a group, exhibited considerable interest in methods for supplying a bacteriologically clean air. This is reflected by the number of combinations of air cleaning methods reported. In the face of an absence of standards for the degree of air cleaning required, the availability of project funds appeared in other instances to be the determinant in the selection of surgery air cleaning methods(s).

Other Design Factors with Air Quality Implications

One of the simplest design concepts which can be used to reduce air contamination within enclosed spaces is to increase the number of air changes. It was considered desirable to learn whether air change rates currently being specified are influenced by this consideration. Generally, from 8 to 12 air changes per hour are required in United States practice for thermal loads in operating rooms. Table 3(B) is constructed for comparison with Table 6 in the preceding survey. In reducing survey data to tabular form, the convention was followed of assigning a reported range of air change rates, which extended over more than one range in the table, to the range embracing its mean.

From a review of the table it appears that those air change rates reported are probably based on thermal load requirements, rather than on air quality considerations.

Temperature and Humidity

Table 4(B) which summarizes the prevailing temperature and relative humidity design practice, shows a close adherence on the part of the design group to published standards for both conditions. The extent to which flexi-

Table 2(B)—Vertical and Horizontal Distance Between Any Supply Inlet and Exhaust Outlet

Distance (Ft)	Vertical (No. Replies)	Horizontal (No. Replies)
0-10	24	8
11-20	19	23
21-30	4	12
31-50	5	12
75	1	1
100	0	1
"Maximum distance available"	26	26
"As conditions indicate"	26	26
No response	20	16

Table 3(B)—Rates of Air Change in Surgery

No. of air changes/hr	0-5	6-10	11-15	16-20	21	Depends on cooling load	No response
No. of respondents	1	40	34	4	0	5	15

bility in temperature adjustment is being designed into operating room systems to meet individual preferences on the part of the surgeons and other members of the surgical team could not be ascertained from the questionnaires.

Type of System

Central air distribution systems of various types were designated by all but five of the respondents as first choice. However, many indicated the use of room package units with only one mentioning window-type coolers. This appears to indicate that the selection of the type of system is often influenced by cost and whether the system is a new or remodeled project. A few respondents have employed panel cooling systems.

Fresh Air Supply and Exhaust Air Outlet Locations in Operating Rooms

A great variety of air supply grilles or diffusers and exhaust register designs are used for operating rooms and a systematic study of the rationale for their selection is complicated by cost considerations. Sidewall supply grilles or diffusers were listed in 69 replies (28 nonaspirating, 36 aspirating); 72 replies mentioned ceiling supply diffusers (14 nonaspirating and 54 aspirating); while 20 indicated perforated ceiling panels for the supply.

Though aspirating-type air diffusers complicate any analysis of air flow patterns, an indication of the designers' intents with regard to air movement is shown in Table 5(B).

Table 4(B)—Temperature and Humidity Design Practice

Temperature			Relative Humidity		
Winter (° F)	(No.)	Summer (No.)	Winter (Range-%)	(No.)	Summer (No.)
68	0	1	30-32	1	0
69	0	0	33-37	0	1
70	7	4	38-42	3	2
71	0	0	43-47	1	3
72	8	6	48-52	38	40
73	2	2	53-57	35	37
74	4	2	58-62	8	8
75	38	34	63-67	0	1
76	7	9	No reply	13	7
77	0	3			
78	8	9			
79	0	0			
80	18	23			
No reply	7	6			

Generally, it may be concluded that designers attempt to follow codes which require low exhausts or low exhausts in combination with high exhausts.

Interim Recommendations

Following a review and study of the data in the above surveys, the Committee on Hospital Facilities of the APHA Engineering and Sanitation Section has issued the following interim recommendations for certain design features of hospital operating room air conditioning systems.

A number of the medical, bacteriological, and engineering studies of operating room air conditioning[4-10] have been reported and others are still in progress. Some of these may throw further light on such fundamental issues as the relative amounts of pathogenic bacteria disseminated from various sources or locations within the operating room.[8] Further information upon which more specific recommendations can be made is needed. In consideration of these reported studies and the committee's two surveys, it is recommended that the practices in designing operating room air conditioning systems place greater emphasis upon furnishing the following:

1. Effective temperatures which will, by providing the maximum comfort for the surgeon and the surgical team, help assure optimum conditions for conducting the surgical procedures.

2. An air flow pattern designed to displace, disperse, or accelerate the removal of airborne contamination immediately above the operating table in particular and the operating room in general.

3. An air supply free of biological particulates.

4. An absence of backflow of contaminated air into the operating room from less critical areas, to be achieved, for example, by one or more of the following procedures:

(a) Imbalancing the air supply quantities to the room and the exhaust from the room so as to maintain a positive pressure condition within the room sufficient to cause air to move out of the room through the entire area of openings under all conditions.

(b) Providing an air lock between the room and the more contaminated adjacent areas for the use of personnel who must leave the operating room during surgical procedures in the performance of their duties.

(c) Simultaneous with (a) and (b), providing the same temperatures in adjoining less critical areas as are maintained in the operating room to eliminate air movements set up by air density currents.

5. Outdoor air supply inlets properly located with respect to all forms of exhaust originating within the hospital as well as other contaminating sources.

6. Biological particulate air cleaning devices placed downstream from all other mechanical elements in the air conditioning system and located as near as possible to the point of entry of supply air to the operating room.

7. Locating devices for the removal of biological particulates from exhaust air from highly contaminated sources in the hospital environs as near as possible to their point of origin.

Table 5(B) — Supply and Exhaust Locations

Location	No. of Replies
Supply high, exhaust low	37
Supply high, exhaust high and low	41
Supply high, exhaust high	9
Supply low, exhaust high	1
Not indicated	6
No response	5

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James C. Barrett, chief of the Ventilation Techniques Section, Division of Occupational Health, Michigan Department of Health, served as a member of Mr. Oviatt's subcom-

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Mr. Michaelsen is associate professor and industrial health engineer, School of Public Health, and University Health Service, University of Minnesota, Minneapolis, Minn. Mr. Oviatt is Hospital Consultant, Engineering Division, Michigan Department of Health, Lansing, Mich.

This report was presented before the Conference of Municipal Public Health Engineers, the National Association of Sanitarians, and the Engineering and Sanitation Section of the American Public Health Association at the Eighty-Eighth Annual Meeting in San Francisco, Calif., November 1, 1960.

COMMITTEE ON RESEARCH POLICY

THE American Public Health Association has a history and tradition of encouraging and sponsoring research* useful to the health professions. The continuation and expansion of these efforts of the Association are important to the further development and support of public health.

The APHA recognizes research as a fundamental activity of public health and a fundamental responsibility of public health agencies. Research is essential to good public health programs because it facilitates sound planning, efficient administration, and critical evaluation. The Association believes that research as a part of health programs requires an investment of time, money, personnel, and effort specifically allocated to research.

The Association believes that research in all its forms is essential to the continuing benefit of mankind. It recognizes the essential importance of laboratory and clinical research to community-based research. It is convinced that community-based research should be given high priority at this time.

The policy of the APHA is to:

1. Assist health agencies and institutions in (a) formulating research policies for their organizations; (b) creating and supporting an environment favorable to research; (c) developing and supporting training in research.
2. Promote research by the component Sections, Committees, and Affiliated Societies of the American Public Health Association.
3. Participate in cooperative studies with other institutions, agencies, and groups concerned with health.
4. Encourage the support of community research by government, voluntary health agencies, and private foundations.
5. Foster those concepts of research which promote improvement of the quality of life as well as the prolongation of life.

The American Public Health Association believes it has a responsibility for:

1. Identifying areas of research needs in public health.
2. Providing active leadership in the development of research in public health agencies and institutions.
3. Encouraging a marked expansion of community-based research and the improvement in quality of such research.
4. Promoting the prompt application of research findings to the improvement of public health practice.

The Association desires to cooperate with and assist those interested in and responsible for public health research. All its organizational components will participate in the implementation of these policies and the discharge of these responsibilities.

ROBERT DYAR, M.D.
Chairman

* For working purposes, research is defined as planned and organized scientific efforts carried out under controlled conditions and designed to obtain findings which will have wide application.

Dr. Dyar is chief, Division of Research, California State Department of Health, Berkeley, Calif.

This statement of APHA's Research Policy was adopted by the Governing Council in November, 1960. It is part of the report of the chairman of the Committee on Research Policy presented to the Governing Council at the Eighty-Eighth Annual Meeting of the American Public Health Association in San Francisco, Calif.

ASSOCIATION NEWS

OFFICERS 1961-1962

PRESIDENT: Charles Glen King, Ph.D., New York, N. Y.
PRESIDENT-ELECT: J. W. R. Norton, M.D., Raleigh, N. C.
VICE-PRESIDENT: B. D. B. Layton, M.D., Ottawa, Canada
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DEPUTY EXECUTIVE DIRECTOR: Thomas R. Hood, M.D., New York, N. Y.

DR. CHARLES GLEN KING

Dr. King—The New President

Charles Glen King, Ph.D., D.Sc., president of the Nutrition Foundation, New York City, assumed office as president of the American Public Health Association for 1961-1962, at the 89th Annual Meeting in Detroit, Mich. Dr. King is a biochemist, renowned in this professional capacity for the identification and isolation of vitamin C, the antiscorbutic factor.

The new president was born in the state of Washington in the village of Entiat (population 350), a birthplace that seems to have been auspicious for a leader in the nutritional sciences. Entiat nestles on a plain between the Wenatchee Mountains of the Cascade Range and the spot where the Columbia River, famous among other things for its salmon, and the Entiat River come together. The valley there is known to geographers as a place of fertile, highly cultivated soil which produces the Delicious, the Winesap, the Jonathan and the Staman apples, and to sportsmen as one of their paradises. The APHA president fell in love early with farming, flora and fauna, and the piscatorial art —trout fishing in particular.

Dr. King received his early schooling in Kansas as well as in Washington but returned to his native territory to take

his B.S. degree in 1918 from Washington State College. His pursuit of graduate learning brought him to the University of Pittsburgh which bestowed the M.S. and Ph.D. degrees in 1920 and 1923 and the D.Sc. in 1950. During 1926-1927 he undertook postdoctoral studies and research at Columbia University, and later (1929-1930) did similar work at Cambridge University, England. He received the D.Sc. degree from Washington State College in 1950 and from Drexel Institute in 1954, and the D.P.S. degree from Denison University in 1961.

An active educator for the past 41 years, Dr. King began his teaching career at the University of Pittsburgh where he was successively an instructor, assistant professor, and professor of chemistry. In his final seven years at Pittsburgh (1935-1942) he was also director of the Buhl Foundation Research Group in Chemistry, Biology and Physics. An appointment as visiting professor of chemistry brought him to Columbia University in 1942. Since 1946 he has held the title of professor there. He is also on the Executive Committee of the Institute of Nutrition Sciences at the university.

Before Dr. King became president of the Nutrition Foundation he was its scientific director from 1942 to 1955 and its executive director from 1955 to 1960. As would be expected of a leader in the field of nutrition he is closely associated with work that is international in scope—as special consultant to the United Nations Children's Fund, as a member of the board of directors for the United States Committee for UNICEF, and as a member of the World Health Organization's Expert Advisory Panel on Nutrition. In 1960 he was president of the Fifth International Nutrition Congress held in Washington, D. C. His talents have continuously been pressed into service on the national scene. He is, for example, special consultant to the Surgeon General of the Army and the Public Health Service; on the Executive Committee of the Food and Nutrition Board of the National Research Council; on the Scientific Advisory Committee of the Williams-Waterman Fund, Research Corporation; and on the Board of Trustees, Boyce Thompson Institute for Plant Research. Dr. King is advisory editor for World Review of Nutrition and Dietetics, and from 1953 to 1956 served on the Editorial Board of the Journal of Agricultural and Food Chemistry.

The APHA president has also been president of the American Society of Biological Chemists and the American Institute of Nutrition. Dr. King is an Associate Fellow of the New York Academy of Medicine and counts among his other professional affiliations membership in the National Academy of Sciences, American Chemical Society, Institute of Food Technologists, and two British associations — the Society of Chemical Industry and the Nutrition Society. He is also a member of the American Forestry Association, the American Academy of Political and Social Science, and Phi Beta Kappa.

Dr. King has often been publicly recognized for his contributions to human progress. The Pennsylvania Public Health Association bestowed its Award on him in 1939. Among the other honors he has received are the Scientific Award, Grocery Manufacturers of America (1944) and the Nicholas Appert Medal of the Institute of Food Technologists (1955). In 1959 he was chosen for the City of Pittsburgh Bicentennial Award in Science.

The president was elected a member of the American Public Health Association in 1927 and a Fellow in 1940. In 1947 he became chairman of the Food and Nutrition Section. Three years later he was named to the Executive Board of APHA on which he has served since,

from 1952 to 1960 in his capacity as the Association's treasurer. It is noteworthy that these were years of great importance to the financial development for support of new program in APHA. Dr. King has served on many committees of the Association, for example the Lasker Awards Committees of 1957, 1958, and 1959. He was chosen president-elect at the 88th Annual Meeting of APHA in San Francisco.

Dr. and Mrs. King reside in Scarsdale, N. Y., a metropolitan vantage point for pursuing both horti- and other cultural pleasures, tending as they do a remarkably fine rose garden in the country and indulging their taste for opera and other musical delights in the city. Their spiritual home is the Riverside Church in New York where Dr. King also works on many church committees. The president and his wife are also very happy to be centrally located to their six grandchildren, progeny of Robert B., a neurosurgeon in Syracuse, N. Y., Kendall W., professor of biochemistry at Virginia Polytechnic Institute, and Dorothy who is married to a biophysicist on the faculty of Yale University.

Committee on Scientific Exhibits Awards Citations at Detroit Annual Meeting

Nine scientific exhibits shown at the 89th Annual Meeting in Detroit won certificates of merit from the Committee on Scientific Exhibits during the week of November 13.

The committee, under the chairmanship of S. S. Lifson, surveyed 72 scientific exhibits. Thirty students from the University of Michigan School of Public Health cooperated in the evaluation, together with eight public health educators from Detroit.

The cited exhibits were sponsored by:

Agency for International Development
Communicable Disease Center, Audiovisual Section
Department of the Navy, Bureau of Medicine and Surgery
Michigan Department of Health, Division of Laboratories
Michigan Department of Health
National Heart Institute, Framingham Heart Study
Philadelphia Department of Public Health
U. S. Public Health Service, Division of Accident Prevention
U. S. Public Health Service, Cancer Control Program

NEWS OF AFFILIATED SOCIETIES AND BRANCHES

APHA Affiliated Societies and Branches

Society and Secretary

ALABAMA PUBLIC HEALTH ASSOCIATION, Dr. Allen N. Koplin, 1005 S. 16th St., Birmingham
ARIZONA PUBLIC HEALTH ASSOCIATION, Catharine Weiser, Supervisor of Public Health Nurses, Pima County Health Department, Tucson
ARKANSAS PUBLIC HEALTH ASSOCIATION, Mrs. Lucy DeArman, State Health Dept. Bldg., Little Rock
CALIFORNIA, NORTHERN PUBLIC HEALTH ASSOCIATION, G. Nicholas Parlette, 693 Sutter St., San Francisco 2
CALIFORNIA, SOUTHERN, PUBLIC HEALTH ASSOCIATION, Dorothea Hansen, City Health Dept., Los Angeles 12
COLORADO PUBLIC HEALTH ASSOCIATION, Mrs. Nevin Kilpatrick, 2228 Jasmine, Denver 7
CONNECTICUT PUBLIC HEALTH ASSOCIATION, Mrs. Shirley T. Steidel, R.N., VNA, 28 S. Main St., West Hartford
CUBA PUBLIC HEALTH SOCIETY, Dr. Antonio Goicuria, Calle 30, No. 3301 Marianão, Havana
FLORIDA PUBLIC HEALTH ASSOCIATION, Everett H. Williams, Jr., P. O. Box 210, Jacksonville
GEORGIA PUBLIC HEALTH ASSOCIATION, Mrs. Martha Power, State Health Dept., Atlanta 3
HAWAII PUBLIC HEALTH ASSOCIATION, Mrs. Mapuana P. McComas, 1018 Lunalilo Street, Honolulu
IDAHO PUBLIC HEALTH ASSOCIATION, Ralph Carpenter, 120 N. Capitol Blvd., Boise
ILLINOIS PUBLIC HEALTH ASSOCIATION, William J. Hixon, Evanston Health Dept., Evanston
INDIANA PUBLIC HEALTH ASSOCIATION, Malcolm J. McLelland, State Board of Health, Indianapolis 7
IOWA PUBLIC HEALTH ASSOCIATION, Lloyd Coe, Iowa Hospital Association, 1012 Liberty Bldg., Des Moines
KANSAS PUBLIC HEALTH ASSOCIATION, W. W. Wilmore, Kansas Tuberculosis and Health Assn., 1134 Topeka Ave., Topeka
KENTUCKY PUBLIC HEALTH ASSOCIATION, Peggy Fisher, 275 E. Main St., Frankfort
LOUISIANA PUBLIC HEALTH ASSOCIATION, George M. Ineichen, P. O. Box 1872, Monroe
MARYLAND PUBLIC HEALTH ASSOCIATION, C. Murray Wylie, M.D., 615 North Wolfe St., Baltimore 5, Md.
MASSACHUSETTS PUBLIC HEALTH ASSOCIATION, Mrs. Elizabeth K. Caso, Dept. of Health, Cambridge
MICHIGAN PUBLIC HEALTH ASSOCIATION, Howard Hilton, Washtenaw County Health Dept., County Bldg. Ann Arbor
MINNESOTA PUBLIC HEALTH ASSOCIATION, D. S. Fleming, M.D., State Dept. of Health, University Campus, Minneapolis
MISSISSIPPI PUBLIC HEALTH ASSOCIATION, V. T. Hawkins, State Board of Health, Jackson
MISSOURI PUBLIC HEALTH ASSOCIATION, Mrs. Nadia Craver, 5th Fl., State Office Bldg., Jefferson City
MONTANA PUBLIC HEALTH ASSOCIATION, Mrs. Lou Esmay, City-County Health Dept., Great Falls
NEBRASKA PUBLIC HEALTH ASSOCIATION, Mrs. Jack Carey, Lincoln Dairy Council, 620 Sharp Bldg., Lincoln
NEVADA PUBLIC HEALTH ASSOCIATION, Mrs. Grace Byrne, Nevada TB and Health Association, 711 Fremont St., Las Vegas
NEW JERSEY PUBLIC HEALTH ASSOCIATION, William J. Chamberlain, 118 W. State St., Trenton 8
NEW MEXICO PUBLIC HEALTH ASSOCIATION, Mrs. Mary Gilliland, State Dept. of Public Health, Santa Fe
NEW YORK CITY, PUBLIC HEALTH ASSOCIATION OF, Frances Ann McVey, 4317 Robinson St., Flushing 55, N. Y.
NEW YORK STATE PUBLIC HEALTH ASSOCIATION, Carline Millican, Rochester Regional Office, State Health Dept., Rochester
NORTH CAROLINA PUBLIC HEALTH ASSOCIATION, Helen Craver, P. O. Box 2975, Winston-Salem
NORTH DAKOTA PUBLIC HEALTH ASSOCIATION, George E. Michaelson, P. O. Box 325, Bismarck
OHIO PUBLIC HEALTH ASSOCIATION, Mrs. June O'Donnell, 3516 Braddock St., Dayton
OKLAHOMA PUBLIC HEALTH ASSOCIATION, Bill Burk, 3400 North Eastern, Oklahoma City
OREGON PUBLIC HEALTH ASSOCIATION, Ruth Conrad, Oregon State Board of Health, P. O. Box 231, Portland
PENNSYLVANIA PUBLIC HEALTH ASSOCIATION, Emma J. Petach, R.N., 324 N. Second St., Harrisburg
PUERTO RICO PUBLIC HEALTH ASSOCIATION, Mrs. Mae de Acin, Apartado 211, San Juan 2
SOUTH CAROLINA PUBLIC HEALTH ASSOCIATION, Emily Anne Easterling, Richmond County Health Dept., Columbia
SOUTH DAKOTA PUBLIC HEALTH ASSOCIATION, Alice Brady, R.N., State Dept. of Health, Pierre
TENNESSEE PUBLIC HEALTH ASSOCIATION, C. B. Tucker, M.D., State Dept. of Health, 420 Sixth Ave., N., Nashville
TEXAS PUBLIC HEALTH ASSOCIATION, Joseph N. Murphy, Jr., State Dept. of Health, Austin
UTAH PUBLIC HEALTH ASSOCIATION, Katherine Brandon, M.D., P. O. Box 25, Foothill Station, Salt Lake City
VIRGINIA PUBLIC HEALTH ASSOCIATION, Robert M. Parker, 401 Colley Ave., Norfolk 7
WASHINGTON STATE PUBLIC HEALTH ASSOCIATION, Vance McCallister, 1509 Public Safety Bldg., Seattle 4, Wash.
WEST VIRGINIA PUBLIC HEALTH ASSOCIATION, Mrs. Katherine L. Brown, State Dept. of Health, Charleston 5
WISCONSIN ASSOCIATION FOR PUBLIC HEALTH, Paul Weis, RR No. 2, Waunakee
WYOMING PUBLIC HEALTH ASSOCIATION, Lee Holder, P. O. Box 2203, Cheyenne
MIDDLE STATES BRANCH, APHA, Thelma Luther, R.N., Dept. of Health, Des Moines 19, Iowa
SOUTHERN BRANCH, APHA, H. W. Stevens, M.D., Court House, Box 7525, Asheville, N. C.
WESTERN BRANCH, APHA, Robert G. Beaumier, 1309 Smith Tower, Seattle, Wash.

Maryland: Disputandum Est.

About 280 persons, more than half the total membership, registered for the annual meeting of the Maryland Public Health Association on October 6 at Frederick.

Dr. John D. Porterfield, Deputy Surgeon General, Public Health Service, opened the scientific sessions with a refreshing discussion of "What's Important in Public Health?," theme of the conference. His vigorous introduction was followed by papers on the importance of various categorical programs. Maternal and child health was covered by

Dr. Arthur Lesser of the Children's Bureau. Dr. I. Jay Brightman of the New York State Department of Health discussed chronic disease and rehabilitation, posing some controversial questions on why home care programs have made relatively little headway. Dr. Charles Goshen of the Maryland Department of Mental Hygiene made suggestions for solving serious problems in mental hygiene.

At the luncheon session, Herbert W. Reichelt, vice-chairman, Board of County Commissioners, Prince George's County, presented the politician's point of view. Although Mr. Reichelt was happy with his local health department, he felt that a more adequate understanding by public health workers of the politician's problems in other areas would help the field make progress faster.

In the afternoon, discussion of categorical programs continued—on communicable disease, environmental health, and medical care. The final panel discussion, led by Dr. George James of the New York City Health Department, dealt with topics that from the generalist's viewpoint are important among the issues facing local public health personnel. Dr. James brought this session to a close with a summary that sent the audience off to their various destinations in Maryland "arguing vigorously."

Frank T. Jones, executive director, Maryland Tuberculosis Association, succeeded J. Howard Beard, M.D., as president, MPHA. His fellow officers for 1961-1962 are:

President-Elect—Charlotte Silverman, M.D., director of planning and research, Maryland State Department of Health

Vice-President—R. W. Koch, public health engineer, Montgomery County Department of Health

Secretary (also Rapporteur)—C. Murray Wylie, M.D., assistant professor of public health administration, Johns Hopkins School of Hygiene and Public Health

Treasurer—H. Berton McCauley, D.D.S., director, Bureau of Dental Care, Baltimore City Department of Health

Representative to Governing Council, APHA—Perry Prather, M.D., director of public health, Maryland State Department of Health.

The Maryland Association of Sanitarians participated in the annual meeting of the MPHA.

Florida: Urban Sprawl to Outer Space

The Florida Public Health Association convened for its 33rd annual meeting in Jacksonville, October 5-7, with a registration of 760 persons.

The moderator and keynote speaker of the opening panel discussion on "Urban Planning and Development" was George W. Simons, Jr., Jacksonville planning and zoning consultant. He stated that many subdivisions are planned "without thought of their relationship to the overall plan of the area"; that as cities have developed outward "the central cores have deteriorated, often attaining a status of slum. Many of these decadent areas are foci for infection, crime, and immorality." Reacting panelists were Walter E. Keyes, Roscoe H. Jones, and Robert J. Ollry.

The second day's general session was given over principally to "Evaluation and Planning for Better Health Services," as seen from the points of view of panelists representing nursing, sanitary engineering, environmental sanitation, the laboratory and statistics, respectively, Janice E. Mickey, Howard Chapman, Ben Freedman, M.D., Ad Harris, and Evelyn Flook. John J. Wright, M.D., was moderator. Earlier, Allan J. Greene, administrative vice-president, Chas. Pfizer and Company, Brooklyn, N. Y., had spoken on "Attaining More Efficient Operation in Industry," and Vlado A. Getting, professor of public health administration, University of Michigan School of Public Health, had explored the potentialities of "Community Self-Study and Changing Public Health," citing available methods for self-survey,

such as the American Public Health Association's "Guide to a Community Health Study" (2nd ed., 1961, $2.50).

In a discussion of "Promoting Public Health Interests through Federal Legislation," Noble J. Swearingen, director of the Washington Office of the APHA, told assembled delegates at the final general session that "if good legislation is not passed in Washington, the fault is not with the legislator, but with you if you have not let him know how you feel about it." He explained that all members of Congress should be well informed about health legislation and detailed the roles the Florida delegation members play in various APHA and FPHA committee positions. At this same session Colonel George M. Knauf, Staff Surgeon of the Air Force Missile Test Center, Patrick Air Force Base, used slides to illustrate his description of the medical problems of preparing an astronaut for his celestial ride and of keeping an accurate and immediate check on his physical condition while in space.

The nine sections of FPHA held their scientific and business sessions on the first and second afternoons of the conference, in a few cases meeting jointly. Sampling topics: public relations, program evaluation, continuity of care, and cooperation between health and welfare departments.

H. Duke Peters, sanitation engineer of the city of Jacksonville, and outgoing president, FPHA, presided over the business meeting at which he pointed out that no one group or section of a health department can possibly carry the ball for the entire department all of the time. An agency's different sections rotate more or less in their own orbit, he said. "However, we must not forget that there are other specialized groups that are functioning and that success or failure as a whole depends upon a coordinated effort of the entire group. If we are to succeed in giving maximum public health protection to those who depend upon us, we must operate as a unit, each doing his or her specialized task within the framework of the whole."

Meritorious Service Awards were given to Ruth Mettinger Nissen, director of the State Board of Health's Division of Public Health Nursing, for her work in setting up a home nursing program, and to Alice Meyers of Lake Worth for her work as director of education for the PTA.

The FPHA amended its by-laws, effective next year, to provide for a new office of president-elect. The members chose Miami Beach for next year's meeting at both the site and time of APHA's 90th Annual Meeting.

Albert V. Hardy, M.D., was elected 1962 president of the FPHA. Dr. Hardy, senior assistant state health officer, will be acting health officer while Wilson T. Sowder, M.D., is on leave of absence as chief, Office of Aging, Bureau of Community Health Services, Public Health Service, Washington, D. C. The FPHA adopted a resolution commending the governor and five members of the board for reappointing Dr. Sowder to his fifth term as state health officer since 1945, for giving him leave, and for designating Dr. Hardy to act in his absence. The FPHA gave Dr. Sowder a standing ovation and two matched traveling bags.

Dr. Hardy's fellow officers for 1961-1962 are:

First Vice-President—Frederick K. Allen, M.D., director, Manatee County Health Department, Bradenton

Second Vice-President—A. W. Morrison, Jr., director, Division of Sanitation, State Board of Health, Jacksonville

Secretary (and Rapporteur)—Everett H. Williams, Jr., director, Bureau of Vital Statistics, State Board of Health, Jacksonville (reelected)

Treasurer—Ramona E. Powers, regional nutritional consultant, State Board of Health, Jacksonville

C. M. Sharp, M.D., assistant state health officer, State Board of Health, Jacksonville, was named Representative

to the Governing Council, APHA; C. L. Brumback, M.D., director, Palm Beach County Health Department, Alternate.

A resolution adopted by the Board of Governors of the Florida Medical Association was read at the final session. It spoke of Dr. Sowder as "This leader in the health field at both state and national levels, this medical statesman, this distinguished physician, devoted public servant and eminent doctor of medicine" and assured him "a warm welcome when he returns to resume his post as Florida state health officer."

Pennsylvania: 12 Years' Difference

The Tenth Annual Health Conference co-sponsored by the Pennsylvania Public Health Association, Department of Health, Medical Society, and Health Council was held at University Park, Pa., August 20-24. The conference attracted approximately 1,000 public health workers who took part in general sessions, special sessions, luncheon meetings, curbstone conferences, business meetings, and film discussions, most of them related directly or indirectly to the conference theme "Years of Transition."

During the first general session, Governor David L. Lawrence pointed out that the recently completed public health survey in Pennsylvania "renews the plea for stronger, more efficient and effective local public health services." Joining the governor in a panel presentation, the commonwealth's secretary of health, Charles L. Wilbar, M.D., cited data to show that the state is not spending nearly enough money to maintain satisfactory levels of public health services. He indicated that the basic factors in a formula for good public health would be "enlightened public opinion and adequate funds for a program which will keep Pennsylvanians well and in top physical and mental condition." A third panel member was Ernest L. Stebbins, M.D., dean, School of Hygiene and Public Health, Johns Hopkins University, Baltimore, who had directed the state-wide public health survey. Dr. Stebbins noted that great progress has been made since the "Keystones of Public Health for Pennsylvania" survey was made in 1948. "In fact," he said, "the Pennsylvania Department of Health has been almost miraculously revitalized over that thirteen-year period."

The panel at the second general session consisted of Pascal F. Lucchesi, M.D., medical director, Albert Einstein Medical Center, Philadelphia; Harald M. Graning, M.D., medical director, Regions I and II, Public Health Service, New York City; and Ethel J. Alpenfels, Ph.D., chairman, Department of Sociology and Anthropology, New York University, New York City. Dr. Lucchesi reviewed the "renaissance public health movement" in Pennsylvania. Dr. Graning told delegates there is too much duplication and splintering of health services, pointing out that a health service survey "showed that 10 to 23 agencies in Pennsylvania may be concerned with the same problem." Dr. Alpenfels described various public health attitudes which she has observed in other cultures.

Marion W. Sheahan, R.N., president, APHA, and deputy general director, National League for Nursing, was principal speaker at the PPHA annual meeting. Wilda Camery, chief, Bureau of Public Health Nursing, Allegheny County, Department of Health, Pittsburgh, was installed as 1961-1962 PPHA president, succeeding Tom F. Whayne, M.D., associate dean of the University of Pennsylvania School of Medicine. Her fellow officers are:

President-Elect—Karl M. Mason, director, Bureau of Environmental Health Services, Pennsylvania Department of Health

Treasurer—Ruth Morgan, assistant director, Bureau of Public Health Nursing, Pennsylvania Department of Health.

At the luncheon meeting of PPHA,

Robert J. Anderson, M.D., deputy chief, Bureau of State Services, Public Health Service, described "The Extra Dimension in Public Health Service." The PPHA Annual Award of Merit was presented to Charles L. Wilbar, Jr., M.D., for outstanding contributions to the advancement of public health in Pennsylvania. Claude P. Brown, M.D., was presented with an honorary life membership in the PPHA—"in recognition of outstanding work as a public health physician."

Among the speakers at other sessions of other conference co-sponsors were Richard D. Rife, executive vice-president, Capitol Hospital Service (almost 500,000 Pennsylvanians over 65 now are covered by Blue Cross hospitalization); Ruth B. Freeman, Ed.D., associate professor, Johns Hopkins School of Public Health, who addressed a luncheon meeting for nurses; and James A. Appel, M.D., who discussed with representatives of state and local medical societies "How a County Organizes Its Medical Care." Some of the special sessions were devoted to nutrition, environmental health, social work, planning and research, medical care, public health administration, air pollution control, institutional care, and problems of decentralization. Curbstone conferences centered on such topics as phenylketonuria, diabetes, tuberculosis, motivation, program statistics, dentofacial deformity, venereal diseases, smoking, and communicable disease control.

A special feature: In order to familiarize school vocational guidance counselors with public health careers, 14 specially selected counselors were invited to the conference as guests of the co-sponsors.

Robert H. Conn, chief, Community Health Section, Pennsylvania Department of Health, was general chairman of the conference and rapporteur.

Nevada: One-Year-Old in Full Harness

The Nevada Public Health Association celebrated its first birthday with a meeting in Las Vegas on September 29 and 30. The nearly 80 members who attended were treated to a technical program running the gamut from the plans for radiation protection to short reviews of chronic disease patterns and programs in Nevada.

Staff members of the Public Health Service Las Vegas Field Station and of the Atomic Energy Commission Nevada Test Site led the registrants on the first day of the conference through an exhaustive review of radiological health matters in the state, paying particular attention to problems that may arise from the newly initiated Nevada test series of nuclear explosions.

Other speakers covered tuberculosis, cancer, heart disease, arthritis and birth defects, welfare, mental and school health to update the delegates on programs and needs for Nevada.

Outgoing NPHA president was Daniel J. Hurley, M.D., state health officer. Officers elected at the first annual business meeting were:

President—Vincent E. Mannino, D.D.S., Las Vegas
President-Elect—Robert G. Bull, Reno
Vice-President—William E. Winikow, M.D., Reno
Secretary—Grace Byrne, Nevada TB and Health Association, Las Vegas
Treasurer—Leah Foster, Las Vegas

The Western Branch-APHA was officially represented by Robert Mytinger, director of the Western Regional Office, APHA, San Francisco.

APHA membership application blank on page XXXI

EMPLOYMENT SERVICE

The following pages present information for those seeking public health personnel and for those seeking positions in public health. Other information concerning vacancies and personnel available is on file in the Association office. Anyone wishing to have the benefit of this additional information can obtain it by writing to the Vocational Counseling and Placement Service of the Association.

Advertising space in these pages is available at special rates **to official** and **voluntary health agencies,** and individuals seeking employment. The charges are $5 for the first 50 words or fraction thereof and $1 for each additional 10 words or fraction thereof. There is no charge to members or Fellows of the Association who desire to utilize the **Positions Wanted** portion of these pages. **Closing date** for receipt of advertisments is the first of the month preceding the desired month of publication.

All correspondence should be sent to the American Public Health Association, 1790 Broadway, New York 19, N. Y.

POSITIONS AVAILABLE

Dentist—with M.P.H. or public health experience, for city of 82,000 and county of 169,000 (three colleges) with active, respected public health program. Full cooperation of local practicing dentists. Salary $9,480-$11,760. E. F. Hersey, M.D., Director, Kalamazoo County Health Department, City Hall, Kalamazoo, Mich.

Public Health Dentist—to direct a specialized dental health program in an assigned area of the state. Experience in public health dentistry and eligibility for licensure required. Salary range $8,640-$10,320. Excellent retirement plan and other employee benefits. Write to Dr. Ermal O'Brian, Chief, Dental Hygiene Division, Ohio Department of Health, Columbus 15, Ohio.

District Health Officer—Greater Anchorage Health District, Anchorage, Alaska, a rapidly growing new community of approximately 95,000 population. Administer a generalized public health program. Minimum salary $14,500. M.D. and M.P.H. required. Public health experience desired but not mandatory. Civil service. Write Mr. Willis Townsend, President, Greater Anchorage Health District, 217 E St., Anchorage, Alaska.

Occupational Health Physician—Bureau chief in charge of one of the major divisions of the Santa Clara County Health Department. Salary range $1,209-$1,469; appointment possible above starting rate depending on qualifications. Requires license or eligibility for license to practice medicine in California, and board certification or eligibility for certification in occupational health. For further information, contact W. Elwyn Turner, M.D., Director of Public Health, Santa Clara County Health Department, 2220 Moorpark Ave., San Jose 28, Calif.

Health Officer—M.P.H. Salary $11,540-$14,040. May hire above beginning rate depending upon qualifications. Department serves a population of 118,000. For applications and further information write to Mr. Dale R. Hill, Chairman, Pueblo City-County Health Department, 151 Central Main St., Pueblo, Colo.

Medical Director—of a state-wide nutrition program, organized as a major program unit in the Georgia State Health Department. Requirements: one academic year of public health (or certification in a specialty requiring considerable nutrition training and experience) and three years of professional experience in an official health agency conducting a generalized program. Liberal retirement and fringe benefits. Entrance salary $12,420, with advance to $16,080. Contact H. M. Chester, Personnel Service, Georgia Department of Public Health, 47 Trinity Ave., S.W., Atlanta 3, Ga.

Public Health Officer—to direct and coordinate public health laboratory, nursing, nutrition, and emergency health mobilization service programs of the Hawaii state health agency. Requires M.P.H. and six years' public health physician experience, three in an administrative or supervisory capacity. Salary $12,192-$14,820. Contact the Department of Personnel Services, 825 Mililani St., Honolulu 13, Hawaii.

Health Officer—for Las Animas-Huerfano District Health Department. Starting salary $13,000 per year. This is an established health

unit with headquarters in Trinidad, Colo. Please contact Dalton Roberts, Administrative Officer, Colorado State Department of Public Health, 4210 East 11th Ave., Denver, Colo.

Public Health Officer I and II—Positions with the Hawaii Department of Health. Grade I as administrator of county public health program on a half-time basis, and Grade II as assistant director of adult health. Requires M.P.H. and graduation from an accredited medical school and, for the I, two years' physician experience, for the II, three years' public health physician experience, one year in administering a public health service program. Salaries—I: $5,268-$6,402; II: $11,064-$13,440. Write to Department of Personnel Services, 825 Mililani St., Honolulu 13, Hawaii.

Local Health Officer—Montgomery County, Hillsboro, Ill. Well established health department. Salary $12,000, with fringe benefits. Prefer person with M.P.H. but will consider someone with public health experience. Valid license to practice medicine in state of Illinois. Apply to Dr. W. T. Douglas, 115 West Wood St., Hillsboro, Ill.

Director of Public Health—Full-time health officer. Salary range $18,000-$20,000. Requirements: possession of license to practice medicine in the state of Illinois, and an M.P.H. degree. Opportunity for the right man to institute a public health program in a growing community located six miles from Chicago. Contact Dr. Robert L. Smith, 5635 State Rd., Oak Lawn P. O., Ill.; phone GArden 3-1199.

Commissioner of Public Health—for the city of Worcester, Mass., population 200,000. Minimum requirements: citizenship, M.D. from Grade A medical school, public health degree, practical public health experience. Well organized staff, 75 full time, 50 part time. Ideal living conditions. Maximum salary at present $15,000. Position now available. Apply, outlining qualifications and background, and salary desired, to Francis J. McGrath, City Manager. City Hall, Worcester, Mass.

Public Health Epidemiologist—VI: $13,885-$16,391 annually; VIa: $14,992-$17,623 annually; plus all Michigan civil service benefits. To fill immediate vacancies in Lansing. Must be licensed to practice medicine in Michigan. One year of professional medical experience required for the VI level; three years of professional medical experience required for the VIa level. A good knowledge of clinical medicine with a board in internal medicine, or eligibility for the board, is desired. For further information contact Mr. Frank Krupiarz, Personnel Officer, Michigan Department of Health, Lansing 4, Mich.

Psychiatrists—for Minnesota program on the move. Men with interest in community-wide problems and public health orientation. Programs tailor-made to community needs, circumstances, and resources. Requires M.D. degree from United States or Canadian school and eligibility for board certification (starting salary $18,000-$20,000), or board certification (starting salary $20,000-$22,000). No applicant hired without prior interview at local expense. 1. Crookston: program emphasis on clinical consultation, expanding to double team in fourth year of operation. Two social workers and two psychologists on staff (one ABEPP diplomate). 2. Virginia: new program started October, 1961, with interest running high throughout the Iron Range; an opportunity to participate in program development. If you are for hunting, fishing, golf, etc., you will like northern Minnesota. For details of each position and community, write, outlining professional background, to Herbert Dörken, Ph.D., Director, Community Mental Health Services, Department of Public Welfare, St. Paul, Minn.

Physician—to travel Midwest with mobile center equipped with x-ray and laboratory. Diagnostic examinations for nonprofit organization. Opportunity for wife as assistant technician. Write Medical Director, Garment Industry Medical Center, 4646 Lindell, St. Louis 8, Mo.

Medical Director—for state-wide Tuberculosis Control Program for the state of Nevada, with headquarters in Reno. Salary $1,007-$1,348, depending upon training, experience, and board certification in an appropriate specialty. License: eligibility for licensure in Nevada. Excellent recreational opportunities, including fishing, hunting, water sports, and mountain climbing. Exceptional fringe benefits. For further information contact Nevada State Personnel Department, Carson City, Nev.

Director, Division of Public Health and Preventive Medicine—Large general hospital. Must have M.D. and M.P.H. degrees. Will direct development of county-wide public health program. Excellent facilities. Salary open. Apply: Rufus R. Little, M.D., Superintendent, Bergen Pines County Hospital, Paramus, N. J.

WORLD HEALTH ORGANIZATION REQUIRES FRENCH SPEAKING SANITARY ENGINEERS FOR AFRICA

Duties:

To act as advisers to Health Ministries or as specialists in environmental sanitation demonstration projects or comprehensive public health projects in: planning and organization of national ES services, water supply and quality control, sewage disposal, milk and food control, sanitary inspection, regulations, etc.; in some projects, design and construction of small sanitary engineering works are emphasized.

Qualifications:

University graduation and post-graduate training in sanitary engineering. Progressive experience, including preferably work in public health services.

Fluency in French essential.

Salary range: US $7,300 to 9,500 per annum, net of tax, plus post and dependants' allowances. Sickness and accident insurance, annual and home leave rights. Liberal terminal payments.

The initial contract is for two years, subject to renewal.

Applications to be sent to
World Health Organization
Personnel Office (Africa)
Palais des Nations
Geneva
Switzerland

Pediatrician—Board eligible or certified to work as public health physician with the Maternal and Child Health Division of the New Mexico Department of Public Health as medical director of a clinic for mentally retarded children, as well as general maternal and child health work. Write A. Looram, M.D., Director, Maternal and Child Health Division, State Health Department, Santa Fe, N. M.

Health Commissioner—General Health District, Cuyahoga County, Ohio. Department budget exceeding $500,000 yearly; employing over 50 public health nurses; serving 25 contract school districts and 30 contract cities. An outstanding opportunity for service with smoothly functioning department. Must qualify for Ohio physician's license. In addition to giving qualifications, age, and references, please express in some detail your concept of the responsibilities of a health commissioner. Write Marston G. Bergmann, Esquire, President, Board of Health, 6465 Pearl Rd., Cleveland 30, Ohio.

Public Health Physician—Chief, Division of Child Hygiene, to direct an expanding program of child health services. Salary range $13,200-$15,840. Requires physician with specialized training and experience, and eligibility for Ohio license. Write Director, Ohio Department of Health, Columbus 15, Ohio.

Director of Public Health—for Lane County, Eugene, Ore. (population 165,000). Modern, progressive public health program in a growing community, including school health services. Also to serve as County Medical Investigator. Staff: 48 full time, two part time. Qualifications: M.D., M.P.H., experience in directing a public health program, and possession of or eligibility for a license to practice medicine in the state of Oregon. Salary $13,080-$15,480. Liberal vacation and sick leave allowances, Social Security, retirement, group health and life insurance benefits. For applications and further information write A. T. Johnson, Personnel Director, Oregon State Board of Health, P. O. Box 231, Portland 7, Ore., or Lane County Board of Commissioners, Courthouse, Eugene, Ore.

District Health Officer—Tri-County Unit; headquarters Bend, Ore. M.D. and M.P.H. degrees, and eligibility for medical licensure in Oregon. Salary $13,200 a year to start. Write to Mr. A. T. Johnson, Personnel Director, Oregon State Board of Health, P. O. Box 231, Portland 7, Ore.

District Health Officer—Public health administrator of a district area; district epidemiologist. Plan, organize, supervise work of professional staff consisting of engineers, nurses, sanitarians, nutritionists, dental hygienists, health educators, and social workers. Requires M.D. and M.P.H. degrees and license to practice medicine in Wisconsin. Salary: starting rate $1,006, $1,131, or $1,256 per month, depending on training or experience which can be credited toward board certification in public health. Civil service, vacation, sick leave, Social Security, retirement, group health and life insurance benefits, travel allowance. For applications and further information write R. J. Siesen, Personnel Officer, State Board of Health, State Office Bldg., Madison 2, Wis.

Director of Professional Training and Medical Public Health Consultant—Stimulate, assist in the development of, and coordinate all professional public health in-service training programs of the State Board of Health, and provide consultation and information on preventive medicine, public health, and programs to county medical societies and individual practicing physicians. Requires M.D., M.P.H. degree, license to practice medicine in Wisconsin, three years' experience in public health administration, and eligibility for certification by the American Board of Preventive Medicine. Salary: start at $16,272, merit increases to $18,072. Civil service, vacation, sick leave, Social Security, retirement, group health and life insurance benefits, travel allowance. For applications and further information write R. J. Siesen, Personnel Officer, State Board of Health, State Office Bldg., Madison 2, Wis.

Public Health Nurses—Orange County in Southern California has several positions available with a starting salary of $464 per month and increases to $575 per month. Benefits include three weeks' paid vacation, ten holidays, liberal sick leave, and free medical insurance. Positions require California R.N. and PHN certificates and ability to obtain California's driver's license. For further information contact Orange County Personnel Department, 801-C North Broadway, Santa Ana, Calif.

Qualified Public Health Nurse Supervisor—for three-county health unit serving a population of 25,000 in the mountains of southwest Colorado. Qualified health officer, five-nurse staff. Salary dependent on qualifications. Nurse will have administrative and supervisory responsibilities. Send biography with inquiry to Dr. Arthur Warner, San Juan Basin Health Unit, P. O. Box 140, Durango, Colo.

Public Health Nursing Supervisor—Montgomery County Health Department, Hillsboro, Ill. Salary $6,000-$7,200. Appointment at rate commensurate with training and experience. Good personnel policies, generous fringe benefits. Must have had an approved program of study in public health leading to a bachelor's degree. M.P.H. in public health nursing is desirable. Apply to Dr. W. T. Douglas, 113 West Wood St., Hillsboro, Ill.

Executive Director—Public Health Nursing Association. Own headquarters; 16-nurse staff; generalized nursing service. Administrative ability and M.A. degree desired. Salary open. Apply to Mrs. Fred P. Bamberger, Personnel Committee Chairman, 2906 Bayard Park Dr., Evansville, Ind.

Orthopedic Nursing and Physical Therapy Consultant III—Progressive crippled children agency has an opening due to retirement. Work as a consultant in an assigned area, giving guidance and counsel to local workers in services for crippled children. B.S. degree in public health nursing, graduation from an approved school of physical therapy, and three years' experience are minimum requirements. Salary $6,577.20-$8,414.64. All Michigan civil service benefits. Write Nursing Division, Michigan Crippled Children Commission, 252 Hollister Bldg., Lansing 4, Mich.

Public Health Nurse III (District Advisory Nurse)—Give guidance and counseling to all public health nurses in a multiple-county area regarding community organization and relationships, program planning, public health nursing technics, records, and re-

OCCUPATIONAL HEALTH PHYSICIAN

Certified in Occupational Medicine by the American Board of Preventive Medicine or with acceptable equivalent qualifications including at least three years' occupational medicine experience. To work as occupational medicine and workmen's compensation consultant to medical department of company in the Middle East. Company provides medical care to employees and dependents (300 bed modern hospital, 60 physicians including specialists, 2,000 employee admissions, and 200,000 employee clinic visits annually).

Modern and pleasant family living facilities, excellent schools, interesting travel opportunities. Please send letter outlining personal history, education and experience, and including telephone number, to P. O. Box No. 1433, New York 17, N. Y.

porting. Responsible for inservice education program for local public health nurses and evaluation of nursing services. B.S. degree with major in public health nursing and three years' generalized experience as a public health nurse. Special requirements: registration or eligibility therefor as a registered nurse in Wisconsin; certification or eligibility for certification as a public health nurse in Wisconsin. Salary range $6,072-$7,872. Civil service, vacation, sick leave, Social Security, insurance and retirement benefits. Write Ione M. Rowley, R.N., Director, Public Health Nursing, 119 Monona Ave., Madison 3, Wis.

Public Health Nursing Consultants—to work in both generalized and specialized programs. Requires bachelor's degree in public health nursing and experience. Salary open. Liberal personnel policies, including pension plan, Social Security, sick and annual leave. Further information and application form may be obtained from Personnel Officer, State Health Department, State Office Bldg., Montgomery 4, Ala.

Health Physicist—Organize and direct radiological health activities for the Oregon State Board of Health. Regulations enforcement, source inspection, shielding and waste disposal review, laboratory, training program, public information. One year of graduate health physics training, two years' responsible experience. Salary $655-$810. Applications from Oregon State Civil Service Commission, 100 Public Service Bldg., Salem, Ore.

Sanitarian—Annual salary range $5,900-$7,340, plus longevity increments; New York State retirement system, plus Social Security, vacation, and sick leave policies; car furnished. Minimum requirements are a B.S. degree in sanitary science, veterinary medicine, agriculture, or other branch of science, including courses in chemistry or physics, bacteriology, and biology; and two years' experience in sanitation work related to milk, food, or other phases of environmental sanitation. Write to Chester A. Hicks, M.D., Director, Department of Public Health, New Rochelle, N. Y.

Public Health Sanitarian II—Salary $5,802 first year; $6,492 annual rate of pay in 3½ years; longevity maximum $7,080. United States citizen with college degree in sanitary engineering subjects, dairy industry, or bacteriology. Work involves promotion of sanitation and enforcement of public health laws. Location in a beautiful city surrounded by lakes, combines abundant outdoor living with the educational opportunities of a university community. Apply to Personnel Department, 404 City-County Bldg., Madison 9, Wis.

Assistant Director of Research and Development—New position available in expanding, progressive, local health center, St. Louis County Department of Public Health, Clayton, Mo. Emphasis will be on research planning and development to meet the needs of a rapidly growing metropolitan area. Opportunity to follow individual research interests. Salary range $8,076-$9,816. Ph.D. degree and two years of research experience required. Merit system coverage and benefits. Write Earl R. Chambers, Personnel Director, St. Louis County Division of Personnel, 115 North Meramec, Clayton 5, Mo.

Research Consultant—to conduct research program in the field of alcoholism at the state level. Experience in research aspects of alcoholism required. Salary range $8,640-$10,320. Civil service appointment, excellent employee benefits. Write to Mr. Terrence Boyle, Alcoholism Program Chief, Ohio Department of Health, Columbus 15, Ohio.

Public Health Engineer IV—Salary $713-$749-$787-$827-$869; appointment may be above the entrance rate. Requires B.S. in engineering, six years' public health engineering, and registration as a professional civil engineer (sanitation specialty). Interested persons having less qualifications should apply, since this vacancy may be filled at a lower level. Vacancy exists at the State Health Department in Las Vegas, which is only two hours via air from Los Angeles and other nearby metropolitan areas. An excellent opportunity to become associated with a progressive health program. The position is situated in the center of a recreational and cultural area, including the southern branch of the University of Nevada. **Director of Public Health Laboratories**—Salary $617-$749; appointment may be above entrance rate. B.S. with major in bacteriology or allied sciences and one year of graduate study in bacteriology, plus four years' experience in a medical laboratory, including two years in a public health laboratory. Vacancy located in Reno. Apply to State Personnel Department, Carson City, Nev.

Bacteriologists—Maricopa County Health Department, Phoenix, Ariz., has immediate and future openings. Graduation with at least minor in bacteriology and three years' experience in a public health or comparable laboratory; tuberculosis experience valuable. New

building, new laboratory program. Good future. Starting salary $433. Contact Merit System Director, State Capitol, Phoenix, Ariz.

Microbiologist-Virologist — Man or woman: minimum of M.S. degree in microbiology; some experience in tissue cultures, laboratory virology. To assume responsibility for organization, running of virology clinical and research laboratory under supervision of clinical microbiologist. Salary commensurate with training and experience. Send full résumé: Personnel Director, Evanston Hospital Association, 2650 Ridge Ave., Evanston, Ill.

Director, Public Health Laboratory —M.S. degree with major in microbiology, minor in immunology, and five years' experience in a public health laboratory, or a Ph.D. from an accredited university and one year's experience. Excellent opportunity for a qualified applicant. Salary range $461-$564; upward revision being considered. Write to Civil Service Commission, 425 East State St., Rockford, Ill.

Virologist—Master's degree and two years' laboratory experience, including six months in virus laboratory. Starting salary dependent on qualifications. Range $500-$625. Contact Administrative Officer, State Board of Health, Helena, Mont.

Medical Bacteriologist—B.S. degree with major in bacteriology required. Starting salary $6,000 per annum. Write Dr. Robert T. Rogers, St. Lawrence County Laboratory, Canton, N. Y.

Director, Statistical Services Division —Supervise the Division, consult with program directors, plan statistical research, and provide advisory services. Supervise collection, coding, and tabulating of data. Candidacy for Ph.D. and three years' experience, or master's degree and five years' experience. Salary: start at $8,112; maximum $10,512. Vacation, sick leave, retirement and group insurance plans. Write R. J. Siesen, Personnel Officer, State Board of Health, Madison 2, Wis.

Public Health Educator—Salary range $480-$650. Salary level based on experience and training. Challenging opportunity to develop new Industrial Heart Health Program. Staff volunteer committees. Operational and community organization assignments. Apply to Lee Horovitz, Program Director, Los Angeles County Heart Association, 2405 West Eighth St., Los Angeles 57, Calif., DUnkirk 5-4321.

Public Health Educator—to work in a newly established alcoholism program, including information and referral service, professional education, community education, school health education, community and industrial program development. Beginning salary $6,500-$7,000. Write Enos E. Campbell, Peoria Council on Alcoholism, 116 North Dixon Ave., Peoria, Ill.

Health Educator—Male or female, with M.P.H. or equivalent experience, for city of 82,000 and county of 169,000 with active, respected public health program. Three colleges. Salary $5,760-$7,200, plus usual fringe benefits. E. F. Hersey, M.D., Director, Kalamazoo County Health Department, City Hall, Kalamazoo, Mich.

Consultant, Psychiatric Social Work —Challenging opportunity for psychiatric social worker with child guidance clinic experience and professional maturity. Public health focus on primary prevention reaching all facets of everyday family and community living. Creative educational work with parents, lay persons, nurses, public health personnel, teachers, and others. Consultation and in-service procedures emphasized. Assignment to district public health team serving several counties. Experimental and pioneering attitude essential. Master's degree and several years' paid experience, including some in a standard community child guidance clinic. Salary $6,912-$8,952. Civil service benefits. J. L. Wardlaw, Jr., M.D., State Board of Health, Division of Child Guidance, Madison 2, Wis.

Clinical Psychologist—Challenging opportunity for clinical psychologist with child guidance clinic experience and professional maturity. Public health focus on primary prevention reaching all facets of everyday family and community living. Creative educational work with parents, lay persons, nurses, public health personnel, teachers, and others. Consultation and inservice procedures emphasized. Assignment to district public health team serving several counties. Experimental and pioneering attitude essential. Completion (except for dissertation) of academic requirements for Ph.D. in clinical psychology, supplemented by paid experience in standard three-member community child guidance clinic. If M.A., must have four years' experience, three of which have been paid, including some in community child guidance clinic. Salary $7,512-$9,732. Civil service benefits. J. L. Wardlaw, Jr., M.D., State Board of

Health, Division of Child Guidance, Madison 2, Wis.

Chronic Disease Social Worker (Medical or Psychiatric)—Assist in development of a state-wide rehabilitation and home nursing care program emphasizing good team care of handicapped people, mostly elderly. Participate in planning and conducting training institutes on rehabilitation for nurses and other professional personnel with emphasis on psychological and social aspects of aging and chronic disease. Initiate and develop interest and cooperation by social and welfare agencies in the division's local programs for the aged and the chronically ill. Interpret to lay and professional groups the role and function of the social worker in comprehensive patient care. Desirable qualifications: master's degree, plus three years of pertinent experience. Salary starts from $6,912 to $7,632 depending on experience; maximum $8,952. Travel allowance, vacation, sick leave, retirement, group insurance plans. Write R. J. Siesen, Personnel Officer, State Board of Health, Madison 2, Wis.

Social Work Consultant—to provide consultation at both the state and local level on the social service aspects of public health programs for children. Experience in social work involving families of children with health problems required. Salary range $6,900-$8,280. Excellent employee benefits. Write to Dr. Effie Ellis, Division of Child Hygiene, Ohio Department of Health, Columbus 15, Ohio.

Community Mental Health Consultant—for County-City Health Department. First-line supervisory and administrative position with immediate supervision over one public health social worker. Involves community organization activities in developing dynamic aftercare program in collaboration with local state mental institution. Located in suburban community 30 miles north of metropolitan Seattle, close to superior educational, recreational, and cultural facilities. Requirements: M.S.W. with at least three years of post-graduate experience in public health and/or psychiatric setting. Annual salary $6,168-$7,344. **Public Health Social Worker**—Second-line position under direct supervision of above. Casework services to patients in public health programs. Requirements: M.S.W. from accredited school. Annual salary $5,412-$6,444. Write Roger Knipe, M.D., Snohomish Health District, Everett, Wash.

Dental Hygienist—for established dental health program in well equipped, modern health department. Salary range $4,320-$5,400 per year, plus liberal travel allowance. Write to J. H. White, M.D., Director, Weld County Health Department, P. O. Box 521, Greeley, Colo.

Public Health Educator (Dental Hygienist)—Assist in developing dental health programs for preschool and adult groups in a several county area. Coordinate dental health education activities with over-all health education program. College graduation, M.P.H. degree, and two years' experience. Licensure or eligibility for licensure to practice dental hygiene in Wisconsin essential. Salary: Public Health Educator III—start at $6,072, maximum $7,872. Public Health Educator II (without M.P.H. degree)—start at $5,712, maximum $7,212. Civil service, vacation, sick leave, Social Security, and retirement benefits. Write R. J. Siesen, Personnel Officer, State Board of Health, 400 State Office Bldg., Madison 2, Wis.

Director of Public Health Nursing—for Schoharie County, located 40 miles from Albany, N. Y. Department consists of four public health nurses and one registered nurse. Thirty-five-hour work week; starting salary $6,000 yearly, with increments and cost-of-living allowance. Write to Dr. David W. Beard, Assistant Director, Schoharie County Health Department, Schoharie, N. Y.

POSITIONS WANTED

On Box Numbers, Address APHA at 1790 Broadway, New York 19, N. Y.

Assistant Health Officer—M.D., age 30. Presently completing one year of intensive, formal public health residency with large, active county health department. Available July 1, 1962. **Box PH-19,** Employment Service, APHA.

Public Health Veterinarian—D.V.M., M.P.H.; diplomate, American Board of Veterinary Public Health. Desire position in public health administration. Military obligation completed. Any area considered. **Box V-25,** Employment Service, APHA.

Sanitary Engineer—Completing M.S. degree, January, 1962; third-year EIT. Desire position in public health field. Prefer small western or midwestern city. Varied experience in civil engineering. Graduate work in sanitary engineering and management courses. Age 30. **Box E-43,** Employment Service, APHA.

Administrative Nutritionist—Human Nutrition Research—Ph.D., nutrition; minor, institution administration; M.P.H.; M.S., public health nutrition; certificate of dietetics (internship, ADA). Experience: three years of survey (three separate surveys); 16 years of administrative therapeutics and teaching in larger medical training centers; observation in universities, health departments, and agencies in Europe, parts of Asia, Mexico, and Canada. **Box N-11,** Employment Service, APHA.

Public Health Sanitarian—Age 29; married; B.S., California State Polytechnic College, 1955; M.P.H., environmental health (administration), University of Michigan, 1961. Five years' experience in environmental health. Desire administrative or supervisory position with a state or local health department. **Box S-42,** Employment Service, APHA.

Massachusetts Gets Sanitation Code

A cooperative undertaking between Boston University Law-Medicine Research Institute and the Massachusetts Department of Public Health has resulted in the commonwealth's first sanitation code. To date seven articles of the code have been drafted, two of which have already been adopted into law. These two deal with the code's over-all administration and enforcement and with minimum standards of housing.

The two groups have been working together since the institute's founding in 1958. That was the year the legislature passed an enabling act authorizing the MDPH to establish the code in recognition of the need to unify, clarify, and simplify what has been called the "confused tangle" of public health regulations existing among different communities in the state. According to the director of the institute, some 18 states only have a public health or sanitary code.

Both the enabling act and the code's first article entrust the local health boards with primary responsibility and authority for enforcing codal regulations. Furthermore, communities can adopt special regulations to fit their individual situations. It is understood that the state health department can take steps to enforce a violation only if a local health board does not act within a reasonable amount of time.

For the past two years, the institute's staff has worked with the MDPH to educate community health officials in interpretation and enforcement of the code's various sections. This is done through a series of conferences with officials in the various health districts.

The code will continue to be expanded. Meanwhile it will be under constant revision to keep abreast of changing circumstances and advances in the science of public health.

Complete details from Professor William J. Curran, director of the Law-Medicine Research Institute.

BOOK REVIEWS

All reviews are prepared on invitation. Unsolicited reviews cannot be accepted.

PROTECTION AGAINST RADIATION—By John C. Abbatt; J. R. A. Lakey; and J. Mathias. Springfield, Ill.: Thomas (301-327 East Lawrence Ave.), 1961. 235 pp. Price, $6.50.

The authors of this volume have effectively achieved their objective of producing a practical manual of radiation protection for the worker whose scientific background may be somewhat limited and who wishes the essentials of the subject to be set forth simply and briefly. About one-half of the text is devoted to the physical aspects of radiation and its measurement. Included is a well balanced exposition of the nature of natural background radiation and its quantitative relation to man-made radiations.

In the sections of the book devoted to the biomedical effects of radiation exposure, there is presented a review of the present state of knowledge concerning the somatic and genetic effects of exposure to ionizing radiation. Considerable information is included concerning the provisions for laboratory and clinical examinations of workers and the necessary record system. It is emphasized that the medical records must be adequate as industrial medical records. A chapter of three pages on the treatment of radiation effects is so brief and superficial as to be of questionable value in a manual of this kind.

The brief discussion of nuclear weapons under the heading "Atomic Bomb" is either too little or too much. Since the book is industrially oriented rather than militarily, it would seem that a weapons discussion would be extraneous. For civil defense purposes, the treatment would have to be much more ample.

The chapters on standards follow closely the reports of the International Commission on Radiological Protection as to the principles involved. With respect to maximum permissible levels, the authors stress that these are continually under review and should be obtained from the current reports of the ICRP.

For those engaged in radiation protection activities, the general orientation of this volume will need supplementation by the more detailed and specialized treaties and handbooks.

JOHN C. BUGHER

THE CHOICE OF A MEDICAL CAREER. Essays on the Fields of Medicine—Edited by Joseph Garland and Joseph Stokes, III. Philadelphia, Pa.: Lippincott (E. Washington Square), 1961. 231 pages. Price, $5.00.

This is a collection of essays on the various specialties of medicine edited by the editor and associate editor of the New England Journal of Medicine. It also includes two more or less general essays on the art and science of medicine and on the physician's duties and obligations to society and to his patients. Although nowhere is it so stated, the book was apparently designed as an aid to medical and premedical students in planning what sorts of medical careers they might wish to follow. Each of the essays is written by a physician prominent in his particular specialty or field of practice, and this diversity of authorship naturally results in a variation in the scope, quality, and completeness of presentation among the various medical careers. For example, Dr. John Romano requires 32 pages to cover psychiatry, while Dr. Chester Jones pre-

sents the equally important and extensive field of internal medicine in less than six pages.

Another consequence of having each field presented by one of its own practitioners is that the sum of the parts adds up to considerably more than the whole. We learn that each of several fields appears to cover something more than 50 per cent of the practice of medicine, and that a number of them are the "most interesting" or "most challenging." These are, however, but natural consequences of having individuals competent in and dedicated to their particular fields present them; and they serve the useful function of reminding the reader that he is not dealing with completely unbiased evaluations of the various specialties.

Those interested in or studying for medical careers will find that this book presents very well the wide variety of opportunities in medicine. Physicians may also find it an interesting collection of professional introspective exercises.

ROBERT E. COKER, JR.

COMPARATIVE MEDICINE IN TRANSITION
—Proceedings of the First Institute on Veterinary Public Health Practice, 1958. Ann Arbor, Mich.: University of Michigan School of Public Health, 1960. 499 pp.

This volume reflects a noteworthy effort to assess the present activities and potential of veterinarians in the field of public health. The title aptly infers its content of historical development as well as the present status of a rapidly evolving concept in public health. This concept of veterinary public health incorporates the role of the veterinarian both as an individual contributor to the solution of problems affecting man's health by means of his technical activities in biological sciences, and, also, his place as part of a demarcated group discipline in public health organization.

The point of time at which the stock-taking occurred was in October, 1958, when the School of Public Health at the University of Michigan organized a meeting to be devoted to discussing an interprofessional approach for using veterinary medical resources in public health. The organizers of this institute and the editors of the resulting volume deserve great credit for their foresight in consolidating information in the field of veterinary public health, an activity which is stimulating ever-increasing interest and work in health and medical circles. As with all new and vigorous concepts, the boundary lines of veterinary public health are not yet fixed. They will probably not become rigid for a long time to come as the realization grows of the enormous potential contributions which remain to be exploited in the veterinary field regarding human health problems.

Included are contributions from distinguished individuals in the medical, veterinary, and allied professions and the resultant discussions which took place. The subject matter covers specific contributions of veterinary research to human disease problems in experimental medicine, food hygiene, chronic diseases, zoonoses, occupational health, ecology, and radiation. Education and training and administrative and organizational problems at various levels are also discussed.

This book will undoubtedly take its place as an indispensable reference source for health and research administrators and educational institutions involved in the application and possibilities of veterinary medicine to public health. While geared particularly to conditions as they exist in the United States, the volume will be of great value also to those authorities in many other countries, both developing and advanced, where veterinary public health activities are making appreciable headway.

MARTIN M. KAPLAN

FAMILY SPENDING PATTERNS AND HEALTH CARE—By H. Ashley Weeks. Cambridge, Mass.: Harvard University Press, 1961. 140 pp. Price, $3.50.

Set forth in this book are the methodology and results of a survey of 500 native-born, white, Protestant, intact families with children in Hackensack, N. J., designed to determine their spending pattern for health, their utilization for health services, and their motivations in seeking or avoiding health care.

This is one more piece to fit into the jigsaw puzzle of surveys of family spending habits—a piece that has been purposely designed to cover a small and carefully selected segment of the population. Whether the author's premise is correct that this particular definition of a population-base reflects "the dominant patterns in our culture" is one which would be fruitless to debate or support until more returns are in.

The material, taken from intensive interviews, is presented in five chapters: I. Characteristics of the Families in the Sample; II. Spending Patterns; III. Utilization and Costs of Health Services; IV. Savings and Health Insurance; and, V. Health Care and Variables Other Than Income.

Some rather surprising findings emerge! For example, there was little variation in the average number of children per family in the four income groups reported. Most of the low-income families that kept budgets did so only for food, clothing, and shelter and not for health ("Health care is something that is bought when the need arises"); but those families who do keep a budget are more likely to defer needed health care than those who do not.

The author concludes that health insurance can provide a form of "compelled planning," and suggests that only if the coverage is comprehensive enough could this population be persuaded to budget sufficient of their income for adequate health care.

Here is a worth-while purchase for those who wish to build a library in this branch of medical statistics.

DONALD B. STRAUS

WATER SUPPLY. Economics, Technology, and Policy—By Jack Hirschleifer; James C. DeHaven; and Jerome W. Milliman. Chicago, Ill.: University of Chicago Press, 1960. 378 pp. Price, $7.50.

Undoubtedly, this book is one of the most provocative and iconoclastic publications ever to confront water-supply authorities. It deals primarily with the economics of development of water resources and it questions many of the policies that have been established on federal, state, and local levels. The text is not easy to read and to comprehend; yet it develops a logical economic analysis that is difficult to counter.

While the major emphasis of the book is on the economic factors of water supply (two of the authors are economists, the other a physical chemist), one chapter gives a thoughtful treatment to the subject of water law and another summarizes carefully the technological features and costs of alternative supplies of water.

The authors maintain that existing water supplies in the United States are misallocated, owing primarily to discriminatory and subsidized pricing patterns and the defective system of water rights. As a result, water supplies in some areas are overbuilt, despite the often repeated cries of "shortages." The overbuilding is attributed to underpricing of water, to questionable technics of project evaluation, to rigidity of outdated water laws, to the overblown concepts of "secondary" and "intangible" benefits, and to the use of a low discount rate for risky projects. The authors illustrate their contentions by strong criticism of the new Cannonsville reservoir and aqueduct for New York City and the California Water Plan.

This book should be required reading

for all legislators on the federal and state level, and for all authorities and students in the field of water resources. Many will be unsympathetic with the findings, but few can refute the logic.

J. E. McKee

MENTAL HEALTH AND SOCIAL WELFARE
—By Robert H. Felix, et al. New York, N. Y.: Columbia University Press, 1961. 203 pp. Price, $3.75.

The 14 papers included in this volume were presented at the National Conference on Social Welfare in 1960, where special emphasis was given to the subject of mental health because of the World Mental Health Year. The contributors represent the professions of psychiatry, psychology, and social work. The range of subjects is broad; the papers, in general, report on interesting new programs in communities.

In the introductory paper, "A Comprehensive Community Mental Health Program," Dr. Felix emphasizes that the hardships of life in America are now primarily psychological and that there has been an increase in the groups that have special problems and need special attention. He pointed out the need for programs providing supportive services to the total population where they are and, especially, during periods of stress or at other critical periods in their lives.

Some of the community programs tested in practice to support and guide vulnerable groups in a community were interestingly reported, such as the programs for street corner gangs in 18 cities; a program where assessment is made of the family and its motivations, and parents are partners in the treatment plan; treatment potentials in public welfare for severely disturbed clients; new methods of home care including psychiatric emergencies; consultation to parents of disturbed children; social group work with hospitalized psychiatric patients as an aid in treatment; problems created by manpower shortage, social action to gain legislative support for mental health and social welfare programs; use of volunteers in mental hospitals; the essential role of social workers in helping patients toward social rehabilitation.

This is an interesting collection of papers presenting some of the newer programs in mental health.

Elizabeth P. Rice

PERSPECTIVES IN VIROLOGY. Vol. II—Edited by M. Pollard. Minneapolis, Minn.: Burgess (426 South 6th St.), 1961. 220 pp. Price, $8.00.

This is a collection of the papers presented at the Second Conference on "Perspectives in Virology" held under the auspices of the Gustav Stern Foundation.

The book consists of 15 lectures, the preponderance directed to the virologist, and especially to the individual interested in the basic aspects. In the area of fundamental virology there are chapters dealing with mutagenesis in vitro, biochemistry of virus-infected cells, the synthesis of polioviruses, the effect of temperature on reproduction of polioviruses, the nature and function of interferon, and others. Thus, this is a book for the practicing virologist. However, the public health worker and the oncologist may find of interest the chapters dealing with the natural history of the parainfluenza viruses, viral infections of the fetus and newborn, and the several chapters dealing with tumor viruses and the proposed criteria for the identification of human oncogenic viruses.

In a field as rapidly expanding as virology, such authoritative summaries, reviews, and philosophical discussions as those in this volume, and in the companion first volume issued two years ago, provide invaluable assistance in keeping abreast of developments.

Edwin H. Lennette

THE AIR WE BREATHE. A Study of Man and His Environment—Edited by Seymour M. Farber and Roger H. L. Wilson. Springfield, Ill.: Thomas, (301-327 East Lawrence Ave.), 1961. 414 pp. Price, $14.

This collection of 20 presentations and five panel discussions represents the proceedings of a symposium at the University of California in January, 1960. "The breadth of the title," says one conferee, "would seem to discourage detached technical reports and invite general examination." Because not all the speakers were so discouraged, the collection is a delectable potpourri of factual meat and potatoes, raw scientific data, provocative food for thought, and philosophic seasonings. Although the imaginative chefs planned a diversified menu, indicated by the subtitle, the main dish is air pollution, and the initial seven chapters on the "normal" atmosphere—including the depths, the heights, and space—are in the nature of an hors d'oeuvre substantial enough to produce indigestion before the entrée arrives. As with most conference proceedings in burgeoning fields, that mysterious interval between presentation and publication antiquates the technical information. Thus, the chapter-end bibliographies have necessarily only an occasional reference as recent as early 1960 (one of these, prematurely, to a book that has not yet gone to press!). But the standard topics are authoritatively covered: the acute disasters and the "slow ruination of health and life" by Richard A. Prindle; effects of specific chemicals by Thomas F. Mancuso; particle size by Theodore F. Hatch; lung function by Malcolm B. McIlroy and Jay A. Nadel; auto exhaust by Leslie A. Chambers; dusts by Jethro Gough; as well as some that are closely akin—airborne radiation by R. R. Newell, and atmospheric ions by the late C. P. Yaglou.

Most stimulating because most controversial is the concluding section on lung cancer. Financial support from the Tobacco Industry Research Committee has not attenuated E. Cuyler Hammond's position that "cigarette smoking can, in fact, lead to lung cancer," or Paul Kotin's that smoking may have a "nonspecific, promoting or cocarcinogenic role." On the other hand, both David F. Eastcott's observations in New Zealand, and Kotin's experimental data exemplify the growing recognition of "other air-borne factors." Dissolving this bone of contention with his simmering skepticism, itself worth the table d'hôte price, Joseph Berkson deplores the "fine semantic efforts" that accept as truth, without scientific corroboration, the statistical association of smoking and environment with lung cancer.

MAY SHERMAN

BOOKS RECEIVED

Listing in this column acknowledges the receipt of books and our appreciation to the senders. Space and the interests of readers will permit review of some, but not all, of the books listed.

ART OF THINKING. Dagobert D. Runes. New York, N. Y.: Philosophical Library, 1961. 90 pp. Price, $2.75.

BOY'S BOOK OF PHYSICAL FITNESS. Hal G. Vermes. New York, N. Y.: Association Press, 1961. 126 pp. Price, $1.95.

CHIROPRACTIC IN CALIFORNIA. A Report by Stanford Research Institute, Southern California Laboratories. Los Angeles, Calif.: Haynes Foundation, 1960. 240 pp. Price, $5.

DICTIONARY OF APHRODISIACS. Harry E. Wedeck. New York, N. Y.: Philosophical Library, 1961. 256 pp. Price, $10.

EDUCATORS GUIDE TO FREE TAPES, SCRIPTS, AND TRANSCRIPTIONS, 1962 (8th ed.). Edited by Walter A. Wittich and Gertie H. Halsted. Randolph, Wis.: Educators Progress Service, 1961. 211 pp. Price, $5.75.

EDUCATORS GUIDE TO FREE SCIENCE MATERIALS (2nd ed.). Edited by Mary H. Saterstrom. Randolph, Wis.: Educators Progress Service, 1961. 315 pp. Price, $6.25.

EDUCATORS GUIDE TO FREE SOCIAL STUDIES MATERIALS (1st ed.). Edited by Patricia H. Suttles and William H. Hartley. Randolph, Wis.: Educators Progress Service, 1961. 427 pp. Price, $6.75.

EXECUTIVES' HEALTH SECRETS. William P. Shepard. New York, N. Y.: Bobbs-Merrill, 1961. 268 pp. Price, $4.95.

EXPERIMENTS IN SURVIVAL. Compiled and edited by Edith Henrich. New York, N. Y.: Association for the Aid of Crippled Children, 1961. 109 pp. Price, $3.50.

GIRL'S BOOK OF PHYSICAL FITNESS. Jean C. Vermes. New York, N. Y.: Association Press, 1961. 126 pp. Price, $1.95.

HANDBOOK OF EMERGENCY TOXICOLOGY (2nd ed.). Sidney Kaye. Springfield, Ill.: Thomas, 1961. 377 pp. Price, $10.75.

HEALTH OF THE AGED. Organization for Health Research T.N.O. R. J. van Zonneveld. Assen, Netherlands: Royal Van Gorcum Ltd., 1961. 439 pp. Price, Sewn Hfl. 22.50.

HUMAN GENETICS. British Medical Bulletin, Vol. 17, No. 3. September, 1961. London, England: British Council, Medical Department, 1961. $3.25.

INSTRUMENTAL METHODS FOR THE ANALYSIS OF FOOD ADDITIVES. Edited by William H. Butz and Henry J. Noebels. New York, N. Y.: Interscience, 1961. 288 pp. Price, $11.

MARKET STUDY OF HOSPITAL HOUSE OFFICERS. Ralph E. Adams. Chicago, Ill.: University of Chicago Press, 1961. 59 pp.

MEDICAL TALKS AND PAPERS. Robert M. Zollinger, et al. New York, N. Y.: Macmillan, 1961. 59 pp. Price, $1.95.

MUNICIPAL REFUSE DISPOSAL. Prepared by the Committee on Refuse Disposal, American Public Works Association with the assistance provided by the U. S. Public Health Service, Department of Health, Education, and Welfare. Chicago, Ill.: Public Administration Service, 1961. 506 pp.

OSTEOGENESIS IMPERFECTA IN SWEDEN. Clinical, Genetic, Epidemiological and Socio-Medical Aspects. Gunnar Smars. (Translated by Maud-Marsden.) Stockholm, Sweden: Svenska Bokforlaget, 1961. 239 pp.

PESTICIDE INDEX. Compiled and edited by D. E. H. Frear. State College, Pa.: College Science Publishers, 1961. 193 pp.

PFIZER HANDBOOK OF MICROBIAL METABOLITES. Compiled by Max W. Miller. New York, N. Y.: McGraw-Hill, Blakiston Division, 1961. 772 pp. Price, $15.

PRINCIPLES OF MEDICAL STATISTICS. A. Bradford Hill. New York, N. Y.: Oxford University Press, 1961. 367 pp. Price, $4.50.

PSYCHIATRY—BIOLOGICAL AND SOCIAL. Ian Gregory. Philadelphia, Pa.: Saunders, 1961. 577 pp. Price, $10.

PUBLIC CLEANSING. Present and Future. A. G. Davies. London, England: E. & F. N. Spon Limited, 1961. 195 pp. Price, 40s. net.

SEMINAR PAPERS ON WASTE WATER TREATMENT AND DISPOSAL. Edited by George M. Reece. Boston, Mass.: Boston Society of Civil Engineers, 1961. 280 pp. Price, $3.50.

SERVICES FOR CHILDREN WITH EMOTIONAL DISTURBANCES. A Guide for public health personnel. Prepared by the Committee on Child Health, American Public Health Association. New York, N. Y.: The Association, 1951. 120 pp. Price, $2.50.

SEVENTEEN. A Novel of Puberty. Carl Erik Soya. Translated from the Danish by Carl Malberg. New York, N. Y.: Eriksson, 1961. 369 pp. Price, $5.

STROKES. How They Occur and What Can Be Done About Them. Irvine H. Page, et al. New York, N. Y.: Dutton, 1961. 226 pp. Price, $4.50.

STUDY OF CRANKCASE VENTILATION SYSTEM CONTROL DEVICE INSTALLATIONS ON THE LOS ANGELES COUNTY FLEET. Wallace Linville and William H. Marmelee. Los Angeles, Calif.: Los Angeles County Air Pollution Control District, 1961.

SURVEY REPORT CEREBRAL VASCULAR STUDY GROUP. Institute of Neurological Diseases and Blindness, National Institutes of Health. St. Louis, Mo.: Bardgett, 1961. 139 pp.

SYMPOSIUM ON RESEARCH IN LEPROSY. Transactions of the Leonard Wood Memorial—Johns Hopkins University. Washington, D. C.: Leonard Wood Memorial, 1961. 281 pp. Price, $3.50.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Raymond S. Patterson, Ph.D., F.A.P.H.A.

Identifying Staphylococci—Standardized methods are essential if phage typing of staphylococci is to be reliable and if the results obtained in different laboratories are to be compared. The Subcommittee on Phage Typing of Staphylococcus of the Nomenclature Committee of the International Association of Microbiological Societies instigated preparation of this paper. Our own Laboratory Section Committee on Staphylococcal Phage Typing urged us to call your attention to the report because of its detailed methods for propagating the phages and a standard testing routine outlined.

BLAIR, J. E., and WILLIAMS, E. O. Phage Typing of Staphylococci. Bull. World Health Organ. 24,6:771, 1961.

Encouraging and Impressive—Evidence is assembled here to indicate that we are making substantial progress in the primary and secondary prevention of many chronic diseases. (Vaccination against poliomyelitis and early detection of diabetes are familiar examples of the two categories.) The number of chronic diseases for which there are available screening tests is also impressive. Major advances against the chronic conditions await only the application of existing means, concludes the author.

BRESLOW, L. Prevention of Chronic Diseases. Canad. J. Pub. Health 52,9:375 (Sept.), 1961.

Epidemiology Around the World—Here are six fine papers on worldwide applications of epidemiology by Candau, Parran, Horwitz, Shannon, Harmon, and Edsall. The very names of these statesman-authors suggest the importance of this symposium designed to celebrate the 150th anniversary of the Yale School of Medicine. Without detracting one whit from the first five, one may hazard the guess that the paper of most immediate interest to us ordinary workers in the public health vineyard will be the last one on the contributions of immunology.

CANDAU, M. G., et al. Epidemiology and World Medicine (and five related papers). Pub. Health Rep. 76,9:793 (Sept.), 1961.

Still Plugging Along—Two years after an Arden House get-together to decide "next steps" in tuberculosis control, a state TB division staff member takes stock in a well told review of things here and now. The author concludes that there is nothing new or revolutionary that offers a one-shot cure for the control problem. The job remains pretty much as before, constant and unrelenting efforts by professional and community workers to see clearly what needs doing and then trying to do it. Reprints are available and well worth the few pennies.

DICKINSON, W., JR. Toward the Elimination of Tuberculosis. Nursing Outlook 9,10:630 (Oct.), 1961.

In Norway Now—Conceivably you might want some day to know about the health service picture in Norway. If so, here is an eye-witness objective and thorough-going account. This much some of you will be pleased to see in print: ". . . voluntary bodies have played a stimulating and notable role in the development of sociomedical services in Norway. An unusual variety of such

agencies have survived in active form notwithstanding the comprehensive, subsidized (official) health service."

ESSEX-CATER, A. Medical Care and Public Health Services in Norway. M. Officer 106, 12:185 (Sept. 22), 1961.

Total Visits Not the Answer—Some of the difficulties in attempting to measure the productiveness of public health nursing services are tellingly discussed here. As these services would seem to be as susceptible of measurement as those in any other part of a community program, the paper should be of interest and value to all who have any sort of administrative responsibility. All will agree that tabulating nursing activities —as some annual reports seem to limit themselves to—is a miserably inadequate measure of service rendered.

FREEMAN, R. B. Measuring the Effectiveness of Public Health Nursing Services. Nursing Outlook 9,10:605 (Oct.), 1961.

About Being Born—The cow elephant with a long gestational period of some 600-odd days bears only a single young who is ready to run with the herd on short notice. The lioness, on the other hand, who has a gestational period of only about 100 days has a litter of immature pups in need of protracted care and protection. Woman, with a long gestational period, usually bears only a single infant so immature that he takes another nine months or so to crawl and still another half year before he walks and talks. What's wrong here? The author-philosopher thinks the reason is that, because man has developed such a big head, he wouldn't be born at all if he weren't born prematurely. The rest of this intriguing hypothesis you'll have to get from the original text.

MONTAGU, A. Neonatal Immaturity in Man. J.A.M.A. 178,1:56 (Oct. 7), 1961.

The Staphylococcus Again—Several experimental situations were set up which suggest that nursery infections are most often spread from the hands of carrier-nurses to the infants. The observations that suggest this to be the principal, if not the only, means of spread are told about in interesting detail.

MORTIMER, E. A., et al. Staphylococcus in the Nursery. Am. J. Nursing 61,10:56 (Oct.), 1961.

Childhood TB Infections—This controlled study tested the efficacy of daily doses of isoniazid in the prevention of post-primary complications in children who were without symptomatic disease but who reacted to tuberculin. The drug proved safe for prolonged treatment, it reduced the occurrence of adverse pulmonary changes, and prevented extrapulmonary complications.

MOUNT, F. W., and FEREBEE, S. H. Preventive Effects of Isoniazid in the Treatment of Primary Tuberculosis in Children. New England J. Med. 265,15:713 (Oct. 12), 1961.

Extramural Psychiatry—The historical introductory approach adopted by this writer offers a hint to other discussants. He envisions what some later-day Gibbon may conclude about mental hygiene of the 50's. Then he moves on to set down what is happening and may yet happen in the 60's. This paper is really about community psychiatry—which is the area that is of most interest to us. Recommended reading.

ROSS, M. Mental Health Programs in the Decade Ahead. Ment. Health 45,4:494 (Oct.), 1961.

Varmints and Such—Of the 215 reported deaths from venomous stings and bites, 71 were attributed to reptiles (mostly pit vipers), 86 to insects (mostly wasps and bees), and 39 to venomous spiders. The paper tells what to do about such various things as rattlesnake bites, black widow attacks, and stingray stings.

RUSSELL, F. E. Injuries by Venomous Animals in the United States. J.A.M.A. 177,13:85 (Sept. 30), 1961.

Is Lead Essential?—Three questions in the realm of human nutrition are answered here. Where does the ever-present lead in the human body come from? Is lead a necessary trace element? Is lead primarily industrial, a product of civilization, or mainly a natural occurrence? The answer to the second is: Lead is probably not an essential element. For the other two you will have to turn to the paper for the answer; they are too involved to be fitted in here.

SCHROEDER, H. A., et al. Abnormal Trace Elements in Man: Lead. J. Chronic Dis. 14,4:408 (Oct.), 1961.

"Perfect Thirty-Six"—For a short and clear summary of what must have been a profitable series of conferences on weight control, this report is commended for your study. Included in it is a "Perfect 36 Index." Subtract your waist measure from your height in inches (no shoes, Girls!). For both men and women 36 to 40 represents a desirable remainder. If below 36 you are on the fat side; if above 40 you're probably underweight. This is not offered as an accurate measure of avoirdupois, but it is a quick and pointed reminder.

SHANK, R. E. Weight Reduction and Its Significance. Nutrition Rev. 19,10:289 (Oct.), 1961.

In Back of the Teeth—For almost obvious reasons dentists were urged to take on nutritional counseling as part of their work in this workshop sort of conference on nutrition. Among the several conclusions of the four study groups is this finding re fluoridation: ". . . it would be tragic if advertising campaigns deluded the public . . . into believing that even regular and careful use of toothpastes containing fluoride were anything like as effective, or in any way a substitute for water fluoridation."

SHAW, J. H. Problems in Relationship of Diet and Nutrition to Dental Carries (and four related papers). J. Am. Dent. A. 63,4:454 (Oct.), 1961.

Insults Compounded — In this study of adenoviral, influenzal, and streptococcal diseases, multiple infections were associated with more frequent hospitalizations, though heightened temperatures and complaints could not be statistically associated in this same way. Simultaneous isolations of the several organisms involved indicate that some, if not all, of the infections were concurrent—not sequential.

STILLE, W. T., et al. Multiple Infections in Acute Respiratory Illness. J. Infect. Dis. 109,2:158 (Sept.-Oct.), 1961.

In Rheumatic Fever—Two debated questions are looked into. Need penicillin be administered to every patient with a streptococcal pharyngitis? Does the rheumatic cardiac patient require lifelong chemoprophylaxis against streptococcal infections? There are no quick and easy yes-or-no answers to either question, so readers who want to be informed will have to see the paper.

STOLLERMAN, G. H. Factors Determining the Attack Rate of Rheumatic Fever. J.A.M.A. 172,12:823 (Sept. 23), 1961.

Point of View — History-minded readers will be stimulated or irritated—possibly they may enjoy—this skeptical look at health practices of earlier medical generations, some of which seem still to be extant. Here are two sentences for your guidance. "What is surprising is that historians seem so ready to believe that, even before the 19th century, medicine significantly effected the course of disease." "Yet we habitually read in sober works confident statements about the cause of the illness or death of great men. . . ."

TODD, J. W. Medicine and History. Lancet 7200:480 (Aug. 26), 1961.

Environmental Hazards—Fifteen papers from the Second National Congress on Environmental Health—for the most part read by officers and/or other leaders of our APHA—are collected and usefully presented in a single issue of

the journal named below. The purpose of the congress was to tell what industry and government are now doing and to pinpoint the things still needing to be done in this day of ever-increasing hazards to health on the land and in the air and water.

VAUGHAN, H. F. Purpose of the Congress. Indust. Med. 30,9:350 (Sept.), 1961.

Entre Nous—Do we have a tendency to sweep these things under the rug? Our British cousins seem not to, but they do discuss things that nice sanitarians don't talk about in most felicitous phrases. For example: "Slaughtering by its very nature is never an unobstrusive activity, and there is good reason for putting it where its impact on the general public will be minimized." The paper is mostly about the 1958 regulations governing abattoir hygiene. It should interest many in our country because we so seldom hear about the subject.

WADHAMS, E. H. C. Hygiene in Abattoirs and Meat Packing Plants. Roy. Soc. Health J. 81,5:268 (Sept.-Oct.), 1961.

Anent Adolescents—In a VD clinic in a highly industrialized (Br.) region, 3 per cent of the males treated in 1938 were adolescents: in 1960, 5 per cent were under 21. Among the 1938 female patients 7 per cent were adolescent, but by 1960 the under-21's constituted about 24 per cent of all. Increasing promiscuity may be the major cause of this uncomforting statistical phenomenon, thinks this researcher.

WATT, L. Venereal Increase in Adolescents. Brit. M. J. 5256:858 (Sept. 30), 1961.

If additional information is desired regarding the articles listed in this bibliography, please communicate directly with the publications in which they appeared; the addresses are furnished for your convenience.

Brit. M. J. (British Medical Journal), British Medical Association House, 19 Tavistock Sq., London, W.C.1, England.
Bull. World Health Organ. (Bulletin of the World Health Organization), Geneva, Switzerland.
Canad. J. Pub. Health (Canadian Journal of Public Health), 150 College St., Toronto 5, Canada.
Indust. Med. (Industrial Medicine and Surgery), 605 N. Michigan Ave., Chicago, Ill.
J. Am. Dent. A. (Journal of the American Dental Association), 222 North Superior St., Chicago, Ill.
J.A.M.A. (Journal of the American Medical Association), 535 North Dearborn St., Chicago, Ill.
J. Chronic Dis. (Journal of Chronic Diseases), Mosby, 3207 Washington Blvd., St. Louis, Mo.
J. Infect. Dis. (Journal of Infectious Diseases), University of Chicago Press, 5750 Ellis Ave., Chicago, Ill.
Lancet, 7 Adams St., Adelphi, London, W.C.2, England.
Ment. Health (Mental Health), 24 Buckingham Palace Road, London, S.W.1, England.
M. Officer (Medical Officer), Chronicle House, 72-78 Fleet St., London, E.C.4, England.
New England J. Med. (New England Journal of Medicine), Massachusetts Medical Society, 8 The Fenway, Boston 15, Mass.
Nursing Outlook, American Journal of Nursing Company, 10 Columbus Circle, New York, N. Y.
Nutrition Rev. (Nutrition Reviews), Nutrition Foundation, Inc., Chrysler Bldg., New York, N. Y.
Pub. Health Rep. (Public Health Reports), Gov. Ptg. Office, Washington 25, D. C.
Roy. Soc. Health (Royal Society for the Promotion of Health Journal), 90 Buckingham Palace Road, London, S.W.1, England.

NEWS FROM THE FIELD

WHO News

Dietary Conditions in Africa Examined

The Fourth Inter-African Conference on Food and Nutrition, sponsored jointly by the Food and Agriculture Organization, the World Health Organization, and the Commission for Technical Cooperation in Africa South of the Sahara, was held in September at Douala, Cameroun. Other countries represented: Central African Republic, Congo Republic (Brazzaville), Congo Republic (Leopoldville), Dahomey, Ghana, Ivory Coast, Madagascar, Mali, Nigeria, Senegal, Sierra Leone, South Africa, Tanganyika, Toga, Tunisia, Uganda, and Upper Volta. Other participants were from Belgium, the United Kingdom, Portugal, and France, along with observers from UNICEF and the UN Economic Commission for Africa.

According to Dr. M. Ganzin, FAO regional nutrition officer for Africa and liaison officer for the conference, "Very little information is available in Africa on the actual requirements for calories and nutrients. . . . Various methods have been used to evaluate this situation and with differing results." The conference discussed establishment of specific requirements by means of standardized methods. Although it is said that the possibility of developing long-term nutritional objectives in parts of Africa is limited, it has also been pointed out that "intermediate consumption targets reflecting the most immediate nutritional objectives can be planned."

Advertising on Drugs Surveyed

WHO now offers an offprint from International Digest of Health Legislation, 1961 (Vol. 12, No. 1, 53 pages) Geneva, entitled "Pharmaceutical Advertising: a Survey of Existing Legislation." This study compares the present laws in some 22 countries.

Noting the rapid increase in the number of pharmaceutical specialities throughout the world and a corresponding increase in pharmaceutical advertising, the survey editors suggest that intensive propaganda tends to expose the general public to various risks, including the dangers surrounding self-medication. Also that legislation laying down strict standards for advertising is essential to safeguard public health and to insure that the public is neither caused unnecessary alarm nor induced to delay seeking treatment when this is needed. Technical advertising intended for the professional audience is also scrutinized; the study by the Albany Medical College in 1957 to evaluate such advertising is cited, for example.

Available from Columbia University Press, 2960 Broadway, New York, N. Y.; 60 cents; also in French.

New Chief Engineer

In November Mark D. Hollis, Assistant Surgeon General and chief engineer of the Public Health Service for the past 12 years, became chief engineer of the World Health Organization, Geneva. Mr. Hollis retires from the PHS after a career of more than 30 years as an officer of the Service, 25 years of them on active duty.

In his new position, Mr. Hollis will direct the environmental health activities of WHO as carried out in the 109 member countries. The assignment involves some expansion of the duties formerly performed by Dr. Herman G. Baity, director of the WHO's Division of Environmental Sanitation, who recently retired.

Preventive Medicine Boards

The next examinations given by the American Board of Preventive Medicine for certification in Public Health, Aviation Medicine, and Occupational Medicine will be held at the following locations on the dates indicated:

Public Health—On a regional basis at various schools of public health. April, 1962.
Aviation Medicine—Atlantic City, N. J. April 6, 7, and 8, 1962.
Occupational Medicine—Chicago, Ill. April 7, 8, and 9, 1962.

Complete details from Tom F. Whayne, M.D., secretary of the Board, 4219 Chester Ave., Philadelphia 4, Pa.

Eight Eyes on Air at All Times

The Public Health Service has begun a continuous air-monitoring program to provide vital information on air-pollution levels in eight major U. S. communities —Chicago, Cincinnati, Detroit, Los Angeles, New Orleans, Philadelphia, San Francisco, and Washington, D. C.

The program is not intended to supplant the periodic sampling conducted by the National Air Sampling Network of the Public Health Service (in operation since 1955) which provides information, at more than 250 urban and rural sites, on average levels of particulate matter and of radiation; and, at 50 sites, on the average levels of two gases—sulfur dioxide and oxides of nitrogen.

The new continuous-monitoring stations will be operated by employees of the participating cities, all of whom have received special training at the Public Health Service's Robert A. Taft Sanitary Engineering Center in Cincinnati, Ohio.

Accessories after these facts—"Blowby" devices will be installed on all cars purchased by the city of Philadelphia starting with 1962 models, following tests by the Departments of Public Health and of Public Property. New York State is now testing one type of blowby device on some of the cars it owns, and plans eventually to test three commercially made devices, according to the report of its Air Pollution Control Board. (NYSAPCB, incidentally, has done a good turn by publishing a one-page flyer on just what, in simple language, blowby devices are. It is called "What Is a Positive Crankcase Ventilating Device," is illustrated, and is a Special Edition, September, 1961, of its new Progress Report. A sample of this may be available from New York State Department of Health, 84 Holland Ave., Albany, or possibly from Health Education Service, P. O. Box 7283, Capitol Station, Albany.) In California, the State Motor Vehicle Pollution Control Board has approved one crankcase control device and criteria for an exhaust control device. Before the board can certify either of these devices for public use, two or more in each category must meet the board's requirements.

Dial the ACS for Life Saving

A new telephone information service, called a first in disease control and health preservation, was instituted by the American Cancer Society in November with the potential of saving thousands of lives in the Philadelphia Area. According to ACS, "by dialing a specially assigned phone number, extremely personal and highly crucial details will be given the person placing the call." To be recorded by a specialist in gynecology, the first message was tailored for women 30 years and over. ACS points out that the service makes it possible for individuals to receive highly personal information without disclosing their identities.

Alcohol Study Center Gets New Home

. The Center of Alcohol Studies which had its beginning at Yale University in 1921 will be relocated at Rutgers Uni-

versity, New Brunswick, N. J., as the Rutgers Center of Alcohol Studies. The new center will be a unit within the Graduate School of the university, and will be cross-disciplinary in its organization and in its teaching and research faculty.

The transfer of the center is being made possible by a National Institute of Mental Health grant which will finance the center's operations through the next six years. The move, to be completed by the spring of 1962, provides for appointments to the Rutgers faculty for all the core personnel at Yale, headed by Dr. Selden D. Bacon, director. Correspondents are requested to use the present address, 52 Hillhouse Avenue, Yale Station, New Haven, Conn., until further notice.

Surplus Foods: Home Demonstration

Representatives of the two bureaus in the Maine Department of Health and Welfare (Augusta)—the nutrition services staff of the Division of Maternal and Child Health, and personnel in the Division of General Relief — recently joined forces in preparing and distributing to welfare recipients nutrition-education materials specifically based on available surplus foods. Among these are recipes compiled by the health unit that accord with the culture and food habits of Maine people. Materials were mimeographed and sent to municipal officers in each of the 240 communities taking part in the Surplus Commodity Distribution Program, and at time of report, one-sixth of these towns had begun using them, Currently the Maine Agricultural Extension Service is planning for demonstrations on the use for optimum nutrition of surplus foods in towns where a home demonstration agent, home economist, dietitian or other qualified person is available to assist. Further details from Dorothy L. Woodcock, nutrition consultant to the health bureau's MCH division.

Western Health Education Institute

In June the first Regional Institute for Professors of Health Education brought together some 100 public health and education leaders from eight western states for an exchange of new knowledge and ideas in their fields. Two conferences were held; one at the University of California at Los Angeles, and the other at the University of Washington, Seattle. Participants were professors of health education in teacher-training programs at the college and university level, and key education and public health personnel. The two co-sponsoring organizations were the American Association for Health, Physical Education, and Recreation and the Public Health Service.

The institute's objectives were to increase the understanding and appreciation of the roles of the scientist, health worker, and educator in improving the health of the public, and to develop closer relationships with professors of health education in teacher-training institutions. The institutes grew out of a national conference held in Washington, D. C., last year, to explore the potentials of such a program. Favorable reception to the 1960 and 1961 sessions, plus evidence of the interest and support of official and non-official agencies in the western states of medical schools, schools of public health, and other groups concerned with school health, has led to preliminary planning for similar regional institutes in Wisconsin, Florida, and Michigan.

Inquiries about participating in or initiating a regional institute of this kind will be welcomed, and should be sent to School Health Section, Division of Community Health Practice, Public Health Service, Washington 25, D. C.

Regional Meet: Preventive Medicine

A second meeting between officials of the Public Health Service (Regions I and II) and professors of preventive

medicine in these regions was held last December, in New York City. Host was the Metropolitan Life Insurance Company. The program committee included Dr. Henry C. Huntley, medical consultant for the PHS Regions; Dr. Jonas Muller, professor and chairman, Department of Preventive Medicine, New York Medical College; and Dr. Duncan Clark, chairman, Environmental Medicine, New York State University College of Medicine.

Dr. David E. Price, deputy director of the National Institutes of Health, discussed current activities of the NIH and in particular new NIH programs for institutional grants, career research professorships, international centers for research and training, and the creation of clinical research centers. Dr. Harald Graning, the regional medical director, presented highlights from the Final Report of the Study Group on Mission and Organization of the Public Health Service.

One session dealt with teaching practices in Regions I and II. Presented was such information as the distribution of teaching hours by subdivisions of preventive medicine by academic year. At other sessions Dr. John R. Paul of Yale led a discussion of the teaching of epidemiology and statistics, and Dr. Count D. Gibson of Tufts spoke on curriculum involving medical and home care programs.

Approximately 50 persons participated, with two representatives invited from each of the medical schools in the regions and from each of the four schools of public health. In addition, representatives of the Bureau of State Services were present. As at the 1959 meeting, arrangement was made for distribution of PHS publications of interest and use to teachers of preventive medicine. The hope was expressed that similar periodic meetings may be organized in other regions of the Public Health Service.

Financial Aid Toward Health Careers

The National Foundation Health Scholarship Program, now in its fourth year, offers scholarships of $500 a year renewable annually for a four-year period. Approximately 500 of these awards will be available in 1962, with a deadline for completed applications of April 1, 1962. Prime consideration is given to deserving students interested in careers in nursing, occupational therapy, physical therapy, medical social work, and medicine. Further information from local chapters of the National Foundation, or National Foundation Health Scholarships, 800 Second Ave., New York 17, N. Y.

PERSONALS

JAMES R. AMOS, M.D.,† formerly health director, Green County Health Department, Springfield, Mo., is now state health officer, North Dakota State Department of Health, Bismarck.

ROBERT E. ARCHIBALD, M.D., M.P.H.,* deputy commissioner, Massachusetts Department of Public Health, and director of the department's Division of Local Health Services, has retired.

GEORGE BAER, D.V.M.,† senior assistant veterinarian, Public Health Service, has been assigned to Griffin Laboratory, Division of Laboratories and Research, New York State Department of Health, Albany.

WILLARD R. BROWN, M.D., M.P.H.,† senior surgeon, Public Health Service, formerly on assignment to the California State Department of Public Health, is now assistant chief, Community Health Practices Services, Regional Office IX, Public Health Service, San Francisco.

WALLACE L. CHAN, M.D., formerly assistant clinical professor of medicine, Stanford University School of Medicine, is now special assistant to the Deputy Surgeon General, Public Health Service, Washington, D. C.

MAYHEW DERRYBERRY, Ph.D.,* chief, Division of Public Health Education, Bureau of State Services, PHS, is now serving as a short-term special WHO consultant to the Health Ministry of Japan.

BRIGADIER GENERAL HOWARD W. DOAN,* MC, USA, is now Deputy Surgeon General, Office

* Fellow.
† Member.

of the Army Surgeon General, Washington, D. C.

GEORGE K. FAIR, M.D.,† formerly chief, Preventive Medicine Division, Office of the Air Force Surgeon General, Washington, D. C., is now health officer, District 4, New Mexico Department of Public Health, Las Cruces.

JEFFERSON FARRIS, JR., formerly director, Division of Public Health Education, Arkansas State Board of Health, is now director of health, physical education and recreation, Arkansas State College, Conway.

ARTHUR J. GRIMES, M.P.H.,* formerly director, Field Services, American Cancer Society, Virginia Division, Richmond, is now forum coordinator, National Health Council, New York City, for 1962 National Health Forum.

LENA A. HEVEY, R.N.,† formerly director of public health nursing, Binghamton (N. Y.) Health Department, is now nurse consultant, National Society for the Prevention of Blindness, New York City.

GRACE L. HEWELL, Ed.D.,* formerly community organization consultant, New York City Youth Board, is now program coordination officer, Office of Assistant Secretary for Legislation, Department of Health, Education, and Welfare, Washington, D. C.

ROBERT J. M. HORTON, M.D., M.P.H.,* formerly professor of epidemiology, School of Public Health, University of Michigan, is now chief, Field Studies Branch, Division of Air Pollution, Public Health Service, Robert A. Taft Engineering Center, Cincinnati, Ohio.

LYNFORD, L. KEYES, M.P.H.,* formerly health education adviser, International Cooperation Administration, Taipei, Taiwan, is now chief, Bureau of Health Education, Illinois Department of Public Health, Springfield.

U. PENTTI KOKKO, M.D., Dr.P.H.,* formerly deputy chief, Laboratory Branch, Communicable Disease Center, Atlanta, Ga., is now chief of the branch, succeeding Ralph B. Hogan, M.D., M.P.H., now director, Division of Laboratories, Pennsylvania Department of Health, Philadelphia.

HILDA H. KROEGER, M.D., M.P.H.,* formerly administrator, Elizabeth Steele Magee Hospital, Pittsburgh, Pa., is now associate research professor of medical and hospital administration, Graduate School of Public Health, University of Pittsburgh.

ARIEL A. MOORE, R.N.,† formerly school nurse, Phoenix (Ariz.) High School and College System, recently on a year's educational leave of absence, is now nursing consultant, Arizona State Department of Health.

WILLIAM J. ORCHARD* was the first recipient of the Water Pollution Control Federation's William J. Orchard Award established by WPCF to honor exceptional contributions to the field.

DANIEL ROSENBLATT, Ph.D., formerly research associate, Psychology Department, Brooklyn College, is now assistant director, Social Science Activities, New York City Department of Health.

JAMES K. SHAFER, M.D., M.P.H.,* formerly chief, Division of Community Health Practice, Public Health Service, is now assigned as director of health services, Office of Civil and Defense Mobilization, Washington, D. C.

OTON SOCARRAZ, D.D.S., formerly in private practice, Havana, Cuba, is now assigned as dental officer, Regional Office VIII, Public Health Service, Denver, Colo.

LEON STERNFELD, M.D.,* formerly health commissioner, Cambridge, Mass., is now director, Division of Local Health Services, Massachusetts Department of Public Health, Boston, and deputy commissioner of the department.

J. KEITH THWAITES, M.P.H.,† formerly executive director, California Heart Association, is now program coordinator and assistant director, Community Service and Education, American Heart Association, New York City.

JAMES A. TOBEY, Dr.P.H., LL.D.,* formerly visiting lecturer on public health law, is now lecturer in epidemiology, and public health, Yale School of Medicine, New Haven, Conn.

MADELINE UHDE,† formerly assistant supervisor, Division of Maternal and Child Health, Newark (N. J.) Department of Health, is now public health nurse consultant, Maternal and Child Health, New Jersey State Department of Health.

WILLIAM M. UPHOLT, Ph.D.,† formerly regional representative for the Communicable Disease Center, Regional Office IX, Public Health Service, San Francisco, is now chief, Research Grants Section, Office of Resource Development for Environmental Health, Bureau of State Services, PHS, Washington, D. C.

JAMES M. A. WEISS, M.D., M.P.H.,* formerly associate professor of psychiatry and acting chairman, Department of Psychiatry, University of Missouri School of Medicine, Columbia, is now professor of psychiatry and chairman of the department.

MARGARET M. WHALEN,† senior nurse officer, Public Health Service, formerly assigned as Area Nurse Officer, Division of Indian Health, Phoenix, Ariz., is now assigned as director, Bureau of Public Health Nursing,

* Fellow.
† Member.

New Hampshire Department of Health, Concord.

ONA R. WHITLEY,* director of mycology and diphtheria laboratories, Indiana State Board of Health, has retired and is now living in North Carolina.

FRANKLIN D. YODER, M.D., M.P.H.,* formerly director, Division of Socio-Economic Activities, American Medical Association, is now director of public health, Illinois Department of Public Health, Springfield.

CONFERENCES AND DATES

American Public Health Association. Ninetieth Annual Meeting, Miami Beach, Fla., October 15-19, 1962.

State and Regional Public Health Meetings—December, 1961, and January, February, 1962:

California, Southern, Public Health Association. Lafayette Hotel, Long Beach. December 8.

Mississippi Public Health Association. King Edward Hotel, Jackson. December 6-8.

Texas Public Health Association. Rice Hotel, Houston. February 11-14, 1962.

Meetings of Other Organizations:

American Academy of Occupational Medicine. Hilton Hotel, Pittsburgh, Pa. February 7-9, 1962.

American College of Surgeons. Los Angeles, Calif. January 29-February 1, 1962.

American Diabetes Association. Detroit, Mich. January 17-21, 1962.

American Osteopathic Association. Las Vegas, Nev. January 15-18, 1962.

Congress of the Pan American Medical Women's Alliance. Manizales, Colombia, South America. February 17-24, 1962.

Council on Social Work Education. St. Louis, Mo. January 17-20, 1962.

Inter-American Conference on Congenital Defects, First. Statler Hotel, Los Angeles, Calif. January 22-24, 1962.

Latin-American Congress on Microbiology, II. Ciudad Universitaria, San José, Costa Rica. December 10-17.

National Dairy Council. Bellevue-Stratford, Philadelphia, Pa. February 5-7, 1962.

National Social Welfare Assembly. New York, N. Y. December 12-13.

Pan American Association of Ophthalmology. Interim Congress. Lima, Peru. January 28-February 3, 1962.

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Principles for Healthful Rural Housing. 1st ed. 1957. 29 pp. $1.00

Proposed Housing Ordinance (new edition in preparation)

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Environmental Aspects of Staphylococcal Infections Acquired in Hospitals (symposium). April, 1960. 40 pp. ..... .35

The Local Health Department—Services and Responsibilities. An official statement of the American Public Health Association. March, 1951. 8 pp. ..... .10

On the Use of Sampling in the Field of Public Health. June, 1954. 24 pp. ..... .40

Poultry Inspection. Official Statement of APHA. November, 1957. 12 pp. ..... .50

Public Health Policy on Radiological Health. An official statement of the American Public Health Association. June, 1960. 4 pp..... .25

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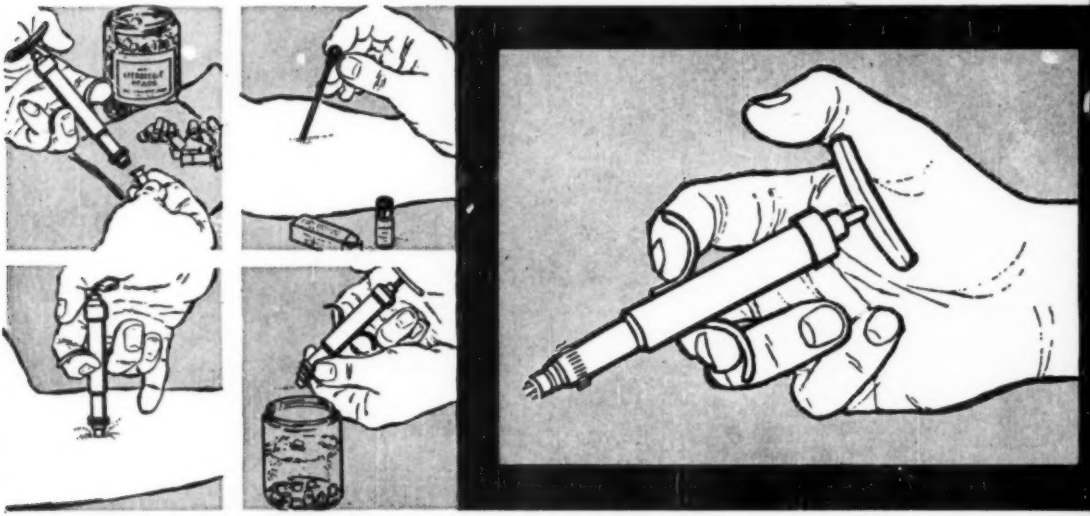

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